
Manitoba



Annual Report 1989 - 90

**Manitoba
Health Services
Commission**

**Laboratory and
X-Ray Services**

April 1, 1989 – March 31, 1990

ANNUAL REPORT - 1989 - 1990
LABORATORY AND X-RAY SERVICES DIVISION
MANITOBA HEALTH SERVICES COMMISSION
WINNIPEG, MANITOBA

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REPORT FROM THE DIRECTOR

Over the past year our Division has responded to new challenges in the provision of diagnostic services in the delivery of health care. I would like to focus briefly on two key areas of our effort over the past year.

Firstly, we have focussed on research and development within the Cadham Provincial Laboratory. To provide good service it is essential to know the emerging areas of health care concerns, and to use technologies which will appropriately address those issues. Research into emerging public health issues, new technology, and the applications and interpretation of new technology are essential for planning future diagnostic and public health services. During this past year, we held a one day retreat to discuss several issues of research and development. We had presentations from divisional staff as well as from individuals involved in research in the private sector, and the University. From this retreat, we have streamlined our internal review of ongoing research projects. This has provided more critical input into the initial planning stages of our research initiatives through an internal peer review process. We have also continued to encourage Divisional flexibility and research, through applications to external funding agencies. Over this past year we have been successful in obtaining several externally funded research grants which will provide valuable scientific, technical and public health information. These grants also help to ensure our links to collaborators. We produce approximately 15 - 20 peer reviewed publications annually, a level which has shown a gradual but steady increase. Our goal has been set to further increase this measure of our research productivity. We have also received encouragement from Industry, Trade and Technology, Government of Manitoba, which has shown a strong focus on research in health care as a priority for the Province. All these efforts are intended for the useful deployment of our service technology in the future. Approximately 50% of the technology used for current service was not available as recently as even six years ago.

Secondly, to provide good service across Manitoba, we have continued our major emphasis on communications and information systems. Through the assistance of the Manitoba Health Services Commission, we have been able to install a microcomputer-linked communications network throughout Manitoba, as a result of the Unisys initiative. We have reallocated one internal position to develop this network to its full potential. We aim to keep abreast of new developments and pass these on through appropriate training sessions to our Divisional staff. A subcommittee of the Supervisors Advisory Committee has been established to help prioritize microcomputer-based applications throughout the Division. We intend to use this network to establish an effective management information system to provide more efficient services.

We aim to continue to provide effective and efficient health care diagnostic services to the people of Manitoba. I acknowledge the strong support of our staff in helping to achieve this goal, especially through research and development, and through effective communications.



LABORATORY AND X-RAY SERVICES DIVISION

SENIOR STAFF LISTING

DIVISION DIRECTOR: G.W. Hammond, M.D., FRCP(C) (Int. Med., Med. Micro., Inf. Diseases)

LABORATORY PHYSICIANS:

J.G. Fox, M.D., FRCP(C) (Path.), Dip. Bact. (Tor),
L. Sekla, M.B., B.Ch., DTM&H, D.M., Ph.D.,
T. Williams, M.B., B.Ch., DPH, FRCP(C) (Ped & Med. Micro)

MANAGER: M.W. Burroughs, FCAMRT, A.C.(R), R.C.T.

SCIENTISTS, CPL:

G. Ahluwalia, B.Sc.,
M. Dawood, Ph.D.
D.E. Gelskey, M.S., MPH, Dr. PH,
A.C. Maniar, M.Sc., Ph.D., D.Sc.,
P. McNicol, B.Sc., Ph.D.,
D. Milley, B.Sc., R.T.
W. Stackiw, B.Sc.,
R. Thompson, B.Sc., R.T.

REGIONAL SUPERVISORS, RURAL UNITS:

EASTERN MANITOBA: X-RAY - L. Wilson, R.T., R.C.T.
LABORATORY - Wm. Strukoff, DHA, R.T.

WESTERN MANITOBA: X-RAY - E. Carroll, R.T., R.C.T.
LABORATORY - W. Yaschyshyn, R.T.

NURSE EPIDEMIOLOGIST: D. Phippen, Reg.N., B.A., C.I.C.

EDUCATION CO-ORDINATORS:

LABORATORY MEDICINE - A.N.C. Delaat, A.R.T.
RADIOLOGY - J.D. Brownlee, B.Sc., R.T.

COMMUNICATIONS OFFICER: J.M. Matthews

DIVISION SPECIALIST TECHNOLOGIST: S. Giercke, A.R.T.

DIVISION ACCOUNTING CLERK: C. McComber

CONSULTANTS:

Chemistry - P. Desjardins, Ph.D.
- L. Seargeant, Ph.D

Radiology - D. W. MacEwan, M.D., FRCP, FACR.

PERSONNEL REPORT

During this fiscal year, the Division welcomed new staff:

Boaz, Linda	MG1	Gimli Lab & X-ray Unit
Beauchamp, Leona	MG1	Lab du Bonnet Lab & X-ray Unit
Friesen, Grace	MG3	Neepawa Lab & X-ray Unit
Gillett, Glen	MG1	Morden Lab & X-ray Unit
Hallett, Linda	MG1	Environmental Micro., CPL
McQuarrie, Laura	LA2	Dauphin Lab & X-ray Unit
Morgan, Grant	MG3	Portage la Prairie Lab & X-ray Unit
Mullally, Claudelle	LB1	Virus Isolation, CPL
Queen, Angela	MG1	Ste. Rose du Lac Lab & X-ray Unit
Sklepowich, Shelly	MG1	Eriksdale Lab & X-ray Unit
Squance, Jacqueline	MG1	Neepawa Lab & X-ray Unit
Van Den Bussche, Sheila	MG1	Killarney Lab & X-ray Unit

Retirements

Nil

Resignations

Bacon, Diane	MG1	Selkirk Lab & X-ray Unit
Field, Roberta	MG1	Dauphin Lab & X-ray Unit
Graboweski, Lois	MG1	Selkirk Lab & X-ray Unit
Kan, David	MG3	Clinical Microbiology, CPL
Loepky, Roland	MG1	Morden Lab & X-ray Unit
Mayor, Grant	MG1	Virden Lab & X-ray Unit
Miller, Glen	LA1	Technical Support Services, CPL
Nisbet, Sheila	MG1	Gimli Lab 7 X-ray Unit
Norrie, Dean	MG1	Administrative Support, CPL
Peters, Tracy	MG1	Technical Support Services, CPL
Rowland, Jacqui	MG1	Russell Lab & X-ray Unit
Schofield, Laurenda	AY3	Swan River Lab & X-ray Unit
Sexton, Allan	MG1	Neepawa Lab & X-ray Unit
Smith, Deborah	CL3	Technical Support Services, CPL

Transferred out of the Laboratory and X-ray Services Division

Nil

Maternity Leaves

Cadham Provincial Laboratory - 9
Lab & X-ray Services - 11

Promotions

Authier, Karen	CT2	Morden Lab & X-ray Unit - July 27, 1989
Colby Dawn	MG2	Clinical Microbiology, CPL - May 20, 1989
Koss, Diane	MG2	Russell Lab & X-ray Unit - Oct. 10, 1989
Lutyj, Anna	MG2	Clinical Microbiology, CPL - Nov 18, 1989
Parsley, Carol	MG3	Clinical Microbiology, CPL - Sept 18, 1989
Romans, Linda	LA2	Administrative Support, CPL - Nov 18, 1989
Wiecek, Anita	CL3	Technical Support Services, CPL - Aug 26, 1989

ADMINISTRATIVE SERVICES SECTION

The Administrative Services Section provides support services to the CPL, the rural Lab & X-Ray Units and the various health facilities and practitioners throughout the province. The section includes accounting, building management, clerical, data entry, shipping, receiving and mail, stores and purchasing.

ACCOUNTING

The Accounting Clerk and the Accounting Clerk's assistant have been very busy this past year coping with the increased number of billings for non-insured services; with processing all the requisitions for the CPL and all the invoices for the Division.

BUILDING MANAGEMENT

A laboratory module was converted to a Level 3 facility with appropriate security measures; the specimen receiving area was equipped with newer, more resilient and less absorbent benching. Since the construction of the HSC new Psych Health Centre is to proceed in the immediate future, no grounds improvements were made. These are shelved until the space situation can be reviewed.

CLERICAL

The CPL is fortunate to be able to gradually equip the clerical staff with personal computers for word processing. At this point in time only 2 clerical staff are without personal computers and plans are underway to equip them as soon as is feasible. The Serology section has not yet been computerized, so the manual filing and retrieving of patient records remains a time-consuming chore for the clerical staff.

DATA ENTRY

This Section was relocated to the second floor of the building so that the data entry staff could be closer to technologists working in the Clinical Microbiology and Virus Sections. Their work area is tight but this section continues to conduct their work at a very acceptable error rate.

SHIPPING, RECEIVING/MAIL

This area has benefitted greatly from the use of a Personal Computer with MS Windows. The vast array of waybills has been simplified using the PC plus Dangerous Goods Shipping Documents. Transcription errors and legibility are no longer problems with these forms. The Electronic Mail System used to send lab reports to physicians/facilities has greatly benefitted this section in the time required to sort, burst and envelope the hard-copy lab reports.

STORES/PURCHASING

The ACC-PAC Inventory System was implemented and is satisfactory for straight inventory. Report production, tailored to our particular needs, has yet to be streamlined.

PERSONAL COMPUTERS AND COMMUNICATION

The Lab & X-Ray Division was fortunate to be able to participate in a government program to acquire 75 Unisys Personal Computers. These Personal Computers are located throughout the Province in rural Lab & X-Ray Units and some in the Cadham Provincial Laboratory. All PC's are equipped for electronic communications using the Procomm software. Initially, the system will be used solely for sending lab reports from the mainframe to user's mailboxes on the Envoy 100 Electronic Mail System. Additional software will be installed as the needs and directions of the Division are clarified.

CLINICAL MICROBIOLOGY

The Clinical Microbiology section continues to provide diagnostic services for rural and urban physicians and their patients. Specialized microbiological testing is provided for all rural and urban laboratories.

Gastroenteritis is a common disease in Manitoba. In the last few years it has been determined that some of these cases are caused by bacterial toxins. Those associated with prior treatment of the patient with antibiotics are usually caused by the toxin of Clostridium difficile. Those associated with ingestion of poorly cooked hamburger meat or unpasteurized milk, to mention only two of the recognized sources, are often caused by the Verotoxin. This is a newly recognized toxin produced by certain strains of Escherichia coli. Both of these toxins and the bacteria producing them are being detected regularly in this section. Special studies have been undertaken in cooperation with Drs. L. Poffenroth and A. Roberts of the Department of Health, and Dr. Sekla's Environmental Microbiology section of the Cadham Provincial Laboratory, where critical food sources are examined for these organisms. Since disease caused by these toxins can be life-threatening it is imperative to detect the toxins so that appropriate therapy can be instituted.

Specimens from patients with sexually transmitted disease comprise a large part of the workload of this section. Computerized reporting of significant results to the Communicable Disease Control section of the Department of Health has greatly enhanced the contact tracing and treatment program. There has been a drop in the number of cases of both chlamydia and gonorrhoea detected in the past two years. At least part of this drop may well be due to the enhanced reporting system. Studies are under way with Dr. J. Embree, University of Manitoba and the Child Abuse Centre, to develop more accurate ways of detecting sexually transmitted diseases in sexually abused prepubertal children. Evaluation of new systems for detecting Chlamydia is an on-going activity and is being carried on in cooperation with Drs. R.C. Brunham and B.A.O. Binns.

Developmental work on Verotoxin tests is being undertaken by Dr. A. Maniar in cooperation with Mr. D. Milley. This is for detection of the Verotoxin in food. Another strategy by the group is detection of the Verotoxin producing genes in the bacteria using a polymerase chain reaction assay. This is being carried out in cooperation with Dr. P. McNicol. Eventually it may be possible to discontinue the use of cell lines for detecting this toxin and possibly to test patient specimens more directly.

See also Tables 6-1 to 6.6.

ENVIRONMENTAL MICROBIOLOGY

This section tests samples of water, wastewater, foods and air to detect microbiological contamination.

Water analysis:

1. A total of 885 water samples were tested for P. aeruginosa and 138 (15.6%) were positive. Of the 138, 130 were serotyped. For the fourth consecutive year, serotype 6 was the most common one, representing 47% of all those typed. Serotype 10 was the second most common serotype (21%).

		1988	1989
Serotype	1	4	11
	2	0	0
	3	3	4
	4	2	7
	5	0	1
	6	16	61
	7	0	0
	8	0	2
	9	1	0
	10	8	27
	11	4	11
	14	1	0
	16	3	2
	Untypable	0	4

2. Forty-five (45) samples of water/wastewater were tested for Salmonella sp., and 7 (16%) were positive. These included:
 - 3 S. virchow isolated from turtle tank
 - 2 S. kentucky isolated from turtle tank
 - 1 S. thompson isolated from turtle tank
 - 1 S. newport isolated from turtle tank
 - 1 S. muechen isolated from iguana and basilisks tank
3. Forty-eight (48) well, pond and spring water samples were tested for iron bacteria. Twelve (12) (25%) of these were from the Steinbach area. Eight (8) of these 12 waters contained iron bacteria. Overall 34 (71%) were positive.
4. Water from the respirator cascade of a rural hospital was found to have coagulase positive S. aureus.
5. Six (6) of 14 water samples received from an indian reserve had Aeromonas hydrophilia. Four (4) of these 6 were toxin positive.
6. Twelve (12) coagulase positive S. aureus were isolated from the swimming pool water from an institution for the handicapped. Enterotoxin A and B with a titer of 1:32 and 1:128 respectively were produced by these isolates.

7. In collaboration with Agriculture Canada the egg wash water monitoring program was continued. Of 111 samples tested, 6 had unacceptable SPC >100,000/mL and 7 had unacceptable pH >10. Of 29 potable water samples collected at these egg wash stations, 6 had coliform levels >2 and were considered unacceptable.
8. An analysis of the membrane filtration procedure for the detection of P. aeruginosa indicated that the mPA-C was less costly, has a faster turnaround time, and is less labour intensive than the MPN. This is now the method in use at the CPL.

Investigation of Foodborne Outbreaks

1. In April 1989, four (4) persons became ill 8 1/2 hours after eating at a local restaurant. Creamed chicken submitted for testing had >30,000 C. perfringens and >1,100 E. coli per gram. The chicken base also had >30,000 C. perfringens. Two (2) of the complaints had >1,000,000 C. perfringens isolated from their stool. Two (2) clinical and 2 food isolates had non-typable C. perfringens phage according to LCDC.
2. In June, two persons became ill 3 hours after eating manicotti at a local restaurant. Coag. positive Staph. were found at a level of 100 per gram of food. Stool samples also were found to have coag. positive S. aureus which produced significant levels of enterotoxin.
3. In June, 79 of 149 guests at a wedding banquet became ill after eating. Of the 3 foods submitted, the potatoes had 50 coag. positive Staph. enterotoxin A (1:32) and 30 C. perfringens per gram. Five (5) guests had coag. positive Staph., enterotoxin A (1:32) and C. perfringens in their stool. C. perfringens phage type 29, was found in the potatoes and in the stools of 3 of the guests.
4. In July, 14 persons attending a family reunion became ill 3 to 4 hours after eating. Symptoms included diarrhea, abdominal cramps and vomiting. Of the 18 foods submitted, 7 had coag. positive Staph. ranging from 800 to 16,000 per gram. All were enterotoxin A positive with titers of 1:8 and 1:16. Six persons had coag. positive Staph. enterotoxin A with levels ranging from 1:16 to 1:32. Three food and 5 clinical Staph. isolates had a non-typable phage.
5. In July, following a B.B.Q. 32 persons submitted stools for E. coli 0157; 9 were positive. Fourteen (14) of 29 persons tested were verotoxin positive, and 5 persons had Staph. aureus isolates. A sample of raw hamburger obtained from the grocery store which had supplied the meat for the B.B.Q. was E. coli 0157 and verotoxin positive.
6. In August, a bus travelling to Thompson stopped at a gas station in Grand Rapids. Two (2) persons were hospitalized 2 hours after eating a salad sandwich there. No clinical specimens were taken. Four (4) foods were submitted and found to have >15,000 coag. positive Staph. aureus.

7. One (1) person in January 1990, ate at a local fast food outlet and became ill approximately 16 hours later. Isolated were 50 coag. positive Staph. aureus per gram of potato salad. Staph toxin type A with a 1:64 titer was found.
8. In January, an outbreak of food poisoning involved 3 persons who had a meal in a local restaurant. The 3 of 5 foods submitted were positive for coag. positive Staph. All isolates produced enterotoxin A with a titer of 1:16. One (1) of the 3 persons submitted a stool sample which also was found to have enterotoxin A producing Staph. aureus. All isolates were phage type 81/82 (typing done in LCDC).
9. The investigation of a possible food poisoning outbreak in a Winnipeg school at a St. Valentine's Day tea revealed one (1) child with Staph. aureus toxin A, one child with Aeromonas hydrophilia, and three (3) children with >1,000,000 C. perfringens in stool. No food was available for testing.
10. In March, three (3) persons complained having nausea, vomiting and diarrhea 2 to 6 hours after eating at a local restaurant. The cooked rice tested had 1.06 million SPC, >1,100 total coliform, and 240 E. coli; on resampling (3 weeks later) the cooked rice had 5.9 million SPC, 9 coliform, 4 E. coli and 10,000 Bacillus cereus. Stool results showed that one (1) person had >1,000,000 C. perfringens per gram of stool.
11. In March, 20 guests of a wedding reception had S. enteritidis isolated from their stools. They experienced nausea and diarrhea several hours after eating dinner. Turkey breast and stuffing which had been served, contained S. enteritidis. The turkey also had 5,250 coag. positive Staph., >300 million SPC, >1,100 coliform, and >1,100 E. coli, and 890 C. perfringens. Both clinical and food S. enteritidis isolated were identified by LCDC as phage type 8.

Analysis of Food and Ice Cream

1. A request by Agriculture Canada for analysis of liver sausage revealed:

5.9 million SPC, 100 coag. positive Staph., a Salmonella Group B, and non-toxigenic E. coli 0157.
2. A total of 2,540 soft ice cream samples were received from the City of Winnipeg Health Inspection services. 3.75 (15%) were unacceptable (having SPC >50,000 and/or >10 TC/gram).
3. A total of 56 food samples were received from Medical Services of Health & Welfare Canada. Fourteen (14) (25%) had unacceptable SPC (>10,000/gram), 24 (43%) had unacceptable TC (>100/gram) and 22 (39%) had unacceptable EC (>0/gram).
4. A total of 21 samples of food on trains were received from CN/CP Rail of which 9 (43%) were unacceptable (SPC >100,000/gram and/or >100 TC/gram and/or >0 E. coli/gram).

Research and Development

1. A study was initiated to determine the prevalence of Verotoxin-producing E. coli in locally available ground beef. In total, 11.5% of the 165 samples tested from May through August were positive. Approximately one-half of the isolates were of the serogroup O157. The remainder were of a variety of serotypes.

The procedure utilized is capable of detecting a variety of gram negative toxin-producing bacteria. In addition to the VTEC, 21% of the beef samples contained cytotoxin (Aerolysin) producing Aeromonas hydrophilia, 0.6% contained cytotoxin-producing Pseudomonas aeruginosa, another 0.6% contained enterotoxin-producing E. coli (labile toxin), and 1.8% contained the newly described Cyto-lethal distending toxin-producing E. coli.

2. At the request of the City of Winnipeg, airborne endotoxin analyses were conducted in 3 sewage treatment plants, at 2 different times of the year, in order to determine whether the lower rates of ventilation occurring during winter months resulted in higher average levels of endotoxin.
3. The development of a new method of VTEC detection, based upon the use of monoclonal antibodies in a colony ELISA system, is currently being explored as a more efficient method of VTEC detection and isolation from environmental sources.
4. At the request of Manitoba Environment a procedure for detection and enumeration of coliphages in water is currently being evaluated. Coliphages are bacteriophages, or viruses that infect coliform bacteria. Thus, they are thought to be a better indicator of virally contaminated water, as their survival characteristics more closely parallel enteric viruses than do those of coliform bacteria.

See also Tables 7-1 to 7-5.

METABOLIC DISEASES AND PUBLIC HEALTH CHEMISTRY

Neonatal Metabolic Diseases Screening Program

The newborn screening program for metabolic and endocrine diseases will mark its 25th year of service to Manitobans in 1990. The program began in a limited way with the ferric chloride diaper test for urinary metabolites of phenylalanine and by 1965 the dried blood filter card specimen utilizing the Guthrie bacterial inhibition assay for phenylalanine was offered province-wide. The program has been voluntary since its inception, yet, through the cooperation of all provincial hospitals we know that practically 100% of newborns are screened yearly. Subsequently, other disorders were investigated and the blood test menu expanded to include other aminoacidopathies and congenital hypothyroidism. A urine card specimen component was added later.

The scope of the program expanded greatly during the 1980's so that Manitoba now has one of the most comprehensive programs on the continent. The section has produced and distributed a users manual for all health care providers who have an input into the program. The manual emphasizes the proper collection and handling of specimens, along with a description of the diseases screened for.

The section screened 17,815 blood specimens and 13,777 urine specimens (100% and 77.3% compliance respectively).

The section requested 478 blood and 290 urine repeat samples for the investigation of possible metabolic disorders and 114 newborns were referred to our consultants for further investigation. Additionally, 155 blood and 908 urine repeat sample requests were made due to inadequate specimen collection, e.g.: insufficient quantity, contamination, etc.

The following metabolic/endocrine disorders were detected:

Hyperphenylalaninemia (1)

C.P.M. (m) - DOB: 20/5/89

Galactosemia (1)

D.C. (m) - DOB: 16/3/89 - Confirmed 4/89

Primary hypothyroidism

M.T. (f) - DOB: 29/4/89

J.H. (m) - DOB: 28/7/89

B.M. (f) - DOB: 12/2/89

Cystinuria (3)

C.A. (f) - DOB: 31/8/84 - Confirmed 89/90

D.A. (f) - DOB: 4/2/87 - Confirmed 89/90

B.T. (f) - DOB: 18/11/88 - Confirmed 7/2/90

Congenital Adrenal Hyperplasia (1)

W. (m) - DOB: 31/12/89

Maternal Serum Alphafetoprotein Screening

Currently the Abbott IMX system is being used, which has increased our low-end sensitivity and decreased turn-around time.

We processed 16,927 patient samples including amniotic fluids, requested follow-up sample and internal repeats. In addition, 3,779 standards and controls were tested for a total of 20,706 AFP tests.

1989/90	First Screening	Follow up Specimens	Internal Repeats	Quality Control & Standards	Total
AFP tests	9,976	1,735	5,216*	3,779	20,706

* Internal repeats are the previously tested specimens on any of the follow-up samples. These are always run in conjunction with the latest samples to practice drift control.

Chemistry

The Metabolic/Chemistry section of the Cadham Laboratory shared in federal and provincial funding of \$2.4 million over 4 years to conduct a Heart Health Survey of Manitobans. Approximately 2,200 persons volunteered to partake. In addition to the common lipid fractions (total, HDL and LDL cholesterol), glycated hemoglobin and fasting blood sugar estimations were performed. Blood pressure and body mass calculations were also made in order that an accurate estimation of the cardiovascular fitness of the population could be determined.

In 1989/90 we processed 52,777 routine tests. We took advantage of the Heart Health Survey and performed 250 of the lipid profiles in parallel with the Lipid Research Laboratory at Toronto. The correlation confirmed our belief that both the accuracy and precision of our lipid assays is comfortably within the guidelines for 1992.

Automated alternatives to many of the manual metabolic screening procedures are currently under investigation by the section. A semi-automated fluorescent immunoassay (DELPIA) for the analysis of thyrotropin in neonatal blood spot specimens has been evaluated as a primary screening assay targeted to replace the existing two-tiered approach to screening for primary congenital hypothyroidism. The system would be a more efficient, cost effective alternative to the two manual radioimmunoassays for thyroxine as the primary screening test, and thyrotropin as the confirmatory assay presently in use.

Enzymatic microtiter plate methodologies are presently being investigated as potential alternatives to existing procedures for other analytes screened by the program.

Meeting the 1992 NCEP-LSP performance guidelines for the analysis of cholesterol has been accomplished within the CPL, as confirmed by extensive correlation with the lipid core laboratory in Toronto. Standardization of cholesterol measurements within the Lab and X-Ray Division is being pursued through the distribution of specimen surveys and calibration material traceable to the NBS and the Abell Kendall reference procedure.

See also Tables 8-1 and 8-2.

SEROLOGY/PARASITOLOGY

In the Parasitology section, parasites are identified in faeces, urine, blood or tissues.

In the Serology section, specific antibodies or antigens are detected in blood samples submitted for the serodiagnosis of infections or autoimmune diseases and for the assessment of the immune status of an individual.

A number of interesting cases were diagnosed serologically:

1. High levels of antibodies to F. tularensis were detected in a 19 year male who developed bilateral axillary adenopathy after an arthropod bite while skinning a rabbit.
2. High levels of antibodies to Yersinia enterocolitica serotype 0:5 were detected in a 25 year old male Winnipeg.
3. High levels of antibodies to Brucella spp. were detected in a 5 year old female with fever of unknown origin and Central Nervous System symptomatology.
4. From September 1989 till March 31, 1990 an unusual increase in the number of requests for pertussis serology was noticed. A total of 381 persons were tested. In October/November 1989 a seroconversion was documented in a 66 year old male from Miami who had an undiagnosed respiratory infection. Significant (4 fold) rise in antibody titres were reported in 3 young children with respiratory illness; a 2 month old male from Roblin, a 3 year old female from Winnipeg and a 3 year old female from LaRiviere. In addition, high levels of antibodies were reported in 71 persons age 20 or older, in 7 persons age 10 - 19, and in 9 persons age 0 - 10.
5. Significant levels of Legionella antibodies were reported in 5 persons. Two (2) had a seroconversion; one, detected in August in a 59 year old male from Winnipeg, the other, detected in February 1990, in a female from Westman. Three (3) other persons had IgM, as well as IgG antibodies, ie a 76 year old female, a 49 year old male and a 73 year old female, all three from Winnipeg.
6. During the months of August to October, 8 persons had significant changes in Coxsackie B antibody levels; all but one had Central Nervous System symptomatology; 4 were from Winnipeg, one each from Neepawa, Swan Lake and Thompson.
7. A case of fulminant Hepatitis A was detected in a 50 year old male who had been vacationing in Mexico. The media reporting of this case resulted in a very significant increase in the number of requests for Hepatitis A testing in returning vacationers.
8. Hydatid disease was diagnosed in a 53 year old woman from The Pas who had a lung abscess. A seroconversion was noticed within 2 days with antibodies reaching levels of 1:524, 288.

9. Four (4) cases of deep mycosis were diagnosed serologically by the National Reference Centre. Coccidioidomycosis was diagnosed in a 62 year old woman from Lac du Bonnet and in a 59 year old male from Winnipeg. Aspergillosis was diagnosed in a 79 year old male and in a 54 year old female from Oakville. All 4 patients had respiratory symptoms.

Serological Testing for AIDS

The number of requests for AIDS testing has continued to increase. The number of positives/number tested are shown in Table 9-14, listed by epidemiological risk category. Tables 9-12 to 9-17 summarize the yield of the HIV serodiagnostic program to HIV since it started in December 1985.

In addition, the Serology section submitted a proposal for an unlinked anonymous seroprevalence study of HIV antibody using leftover bloods. The study was accepted by NHRDP and started on April 1, 1990.

Studies in Association With External Collaborators

1. A total of 861 tests were done on 283 persons tested for the presence of HI antibodies to Influenza A and B in collaboration with Dr. F. Aoki.
2. In collaboration with Manitoba allergists, 133 patients were tested for the presence of Allergy, using a new in-vitro test (Phadiatop), as well as in-vitro testing for IgE antibodies. Results of these tests were compared with data provided by allergists on the history, clinical status, allergy status and skin testing. The predictive positive value of Phadiatop was 95% when compared with skin testing; however the negative predictive value was only 48%. This test was intended to help general practitioners to decide on whether referral of patients to an allergy specialist was justified. It was felt that the highly selected patient population referred out by allergists was not truly representative of the patient population seen by general practitioners and a suggestion was made that research funds be obtained for a more complete study involving rural general practitioners.
3. Dr. Long initiated a case control study to determine the relative risk of HIV-1 seropositivity for pulmonary tuberculosis in rural Haiti. The CPL tested a total of 528 sera (274 proven T.B. cases and 274 controls) for antibody to HIV-1 using 2 different commercial ELISA tests. All positive samples were confirmed by IFA and Western Blot. There were 67/274 (24%) positive for HIV-1 antibody in the T.B. cases and 8/247 (3%) in the control group. Conclusions were that the risk of T.B. was 17 times as great in the seropositive group compared to the seronegative ones and that an HIV-1 infection is a major risk factor for pulmonary T.B. in young adult residents of Haiti.
4. A commercially available kit (Ipazyme, Savyon Diagnostics), utilizing an immunoperoxidase procedure for the detection of Chlamydia IgA and IgG was publicized as a simple, low cost method of diagnosing

chlamydial infections. A study was initiated by Dr. Katz of the Mount Carmel Clinic to compare the sensitivity and specificity of this test with the clinical symptoms, an ELISA detection test (Chlamydiazyme) and PCR. Five hundred and ten (510) patients on whom blood and swabs were obtained were included in the study. Results of the study are currently being analysed.

5. Western Equine Encephalitis (WEE)

Sera from sentinel flocks of chickens were tested for the City of Winnipeg during the summer of 1989. Ten (10) chickens were placed in each of five (5) locations ie Charleswood Lagoon, McPhillips sludge beds, Assiniboine Park Zoo, University of Manitoba, Pandora Avenue (city yards). Chickens were bled and tested prior to exposure, and every two weeks (2) thereafter. A total of 321 sera were tested by the hemagglutination-inhibition method. There was one (1) seroconversion from the Charleswood lagoon on August 15th.

In addition, 51 humans were tested. Low static titers were detected in 7 individuals. One (1) person had high static titers of 1:160. Four (4) horses were tested, all were negative for WEE.

6. Hepatitis B viral DNA

A total of 60 sera were assayed for hepatitis B viral DNA using a ¹²⁵I probe (Abbott), in collaboration with Dr. Gerry Minuk who is attempting to treat hepatitis B carriers.

Evaluation of new commercial kits

1. HIV-1 and HIV-2 ELISA (IAF Biochem, Montreal)

The antigen in this kit is a mixture of HIV-1 and HIV-2 synthetic peptides rather than viral lysates. The reported sensitivity and specificity are 100%, and 99.75%; this test eliminates the foreign protein contaminants that cause false positives in viral lysate tests. Three (3) groups were tested comparing the results of 2 ELISA, IFA and Western Blot: 1) In 76 sera where at least 2 different ELISA screen tests were negative, the correlation was 100%. 2) In a group of 50 sera positive by 2 ELISA and by IFA, the Western Blot (WB) was positive in 47, indeterminant in 2 and negative in 1. The IAF was positive in 49 and negative in one. This sample was also negative by Western Blot. 3) The IAF was negative in all 34 samples which were borderline positive by at least one ELISA but negative by IFA and WB.

2. Hepatitis C Virus (HCV) or Non A Non B (NANB)

The development of a recombinant Hepatitis C virus (C140-3) antigen by Chiron led to the manufacture of ELISA test kits for identification of antibody. The presence of antibody indicates that the individual has been infected with HCV, may harbor infectious HCV, and may be capable of transmitting NANB.

Six hundred and six (606) sera from a high risk group were tested for anti HCV using both Abbott and Ortho kits: 66/606 (10.9%) were found to be antibody positive by both tests. There were 5 discrepancies; 4 which were Ortho positive were negative by Abbott. One (1) positive by Abbott was negative by Ortho. All repeated with similar results. Other groups of interest: antibodies to HCV were detected in 27 of 467 patients with jaundice, who were negative for Hepatitis A and B markers; in 4 of 16 patients who had core antibodies as the sole marker for Hepatitis B; in 4 of 9 intravenous drug users; in 12 of 12 hemophiliacs and in none of 64 dialysis patients tested.

Lyme Disease

1. Ticks

Identification and isolation of B. burgdorferi from ticks submitted by the public was conducted by dissecting the midgut, examining a portion for spirochetes by IFA, and culturing the rest in BSK II media with and without antibiotics. Cultures were kept for 4 to 6 weeks and examined by darkfield.

A total of 114 pools, consisting of 428 adult or nymph Dermacentors were tested. All were negative.

Five Ixodes ticks were sent to the Department of Entomology for identification and for the first time Ixodes dammini was identified in Manitoba. One Ixodes dammini collected in early November was tested and found to be negative.

2. Reservoir

Forty (40) white-footed deer mice and 26 other species were collected from different locations in Manitoba. Tissues (spleen, kidneys, ears) were homogenized and inoculated into BSK-2 media. No B. burgdorferi was isolated from any of these specimens.

3. a. Sera from 666 persons submitted for the serodiagnosis of Lyme disease were tested for specific IgG and IgM by IFA, and by an ELISA procedure (both IgG and IgM). Twenty-three (23) persons had a history of tick bite in 1989, a ring-like rash and significant levels of antibodies.
- b. Sera from 25 dogs were tested. Four (4) (16%) had a significant level of antibody by IFA.

4. Western Blot

Sonicated purified B. burgdorferi (ATCC 35210) was used as antigen. The specific B. burgdorferi proteins were separated according to molecular weights by SDS polyacrylamide gel and transferred to a nitrocellular membrane and reacted with serum diluted 1:100. Antigen-antibody reaction was detected using a biotin-avidin procedure. A serum sample positive by IFA and confirmed by Dr. Schwann, Rocky Mountain Lab., Montana, was also tested in New York by

Western Blot and found to contain major protein bands of B. burgdorferi and is now used as our positive control. Preliminary results on suspect serological positives are encouraging, but the interpretation of the blots in many instances is difficult.

See also Tables 9-1 to 9-17.

TECHNICAL SERVICES

Quality Control

In this section, we provide a number of services to various other sections at Cadham Provincial Laboratory and to Laboratory X-ray Units in Manitoba.

This section is involved in a number of internal and external proficiency testing program for CPL. and LAXUS. We co-ordinate external programs from the College of American Pathologists (CAP) and the Laboratory Center for Disease Control (LCDC) for various sections at CPL. We also maintain stock cultures of all viable organisms in the microbiology programs. External programs that this section co-ordinates includes: CAP Comprehensive Microbiology/Immunology, CAP Virology, CAP Herpes/Chlamydia surveys, and LCDC Microbiology and Virology surveys.

The Quality Control section provides extensive internal programs at CPL for Clinical Microbiology, Virus Isolation, Environmental Microbiology, and the Serology sections. We prepare "blind" specimens from a number of sources. For Microbiology, we rely on our supply of stock cultures, that we continue to update and restock. For Serology, we purchase positive sera from a commercial supplier and use available negative donors for the acute phase. In Virology, specimens are provided by the Section and stored and prepared for distribution by the QC laboratory. Other sources are also used; for example, food is often provided by Health Inspectors. We prepare these specimens as closely as possible to a true clinical specimen, complete with demographic data.

In LAXUS, providing "blind" specimens is impracticable. Therefore, our QC specimens are more like proficiency surveys. Specimens for culture and sensitivities are sent to those units providing microbiology services. Slides prepared from various sources are sent to units providing Gram stain services for staining and interpretation. Urine for pregnancy testing; sera for infectious mononucleosis testing and specimens for rapid testing for Group A Streptococcus are also prepared and provided by this section to those units offering this service.

Evaluations on new or improved products and new lot numbers of products continues to be an integral function of this section. We apply varied criteria to our evaluations, depending on the characteristics we wish to amplify. Evaluations are performed on media, reagents, antimicrobial discs, urine dip slides, blood culture systems, API strips, pregnancy test kits, infectious mononucleosis testing kits and Group A Streptococcus testing kits. Repeat testing is done during the shelf life of the product or if there are problems noted from the field.

From time to time, we change manufacturers, usually when a more superior product is available or if problems occur with performance or reliability. This has recently occurred with our long association with one manufacturer of blood agar base. Another manufacturer has provided a product that by extensive testing has proved to be superior. Although the price is higher improved performance warrants a change to the better product.

We provide stock cultures upon request to various hospital and clinical laboratories and to individuals requesting materials for research purposes.

MEDIA SECTION

This section provides a service to CPL, LAXUS and special agreement units; plated and tubed media, stains and reagents are all supplied on a demand basis.

We have expanded our menu to include new items and replace other preparations. Our new preparations include:

1. Malachite Green Stain - for use as a counter stain for acid fast bacilli in Ziehl Neelson stain.
2. 10% Neutral Formalin - for use in preparing slides for Legionella detection.
3. Phosphate Buffered Saline, pH 7.5 - for use in Virus detection for diluting cell dispersing agents and washing cells.
4. Barbour - Stoenner - Kelly medium - a selective medium for the isoaltion of Borrelia burgdorferi in ticks or biological specimens for Serology.
5. Carbohydrate fermentation media:
5% Sucrose Broth
5% Sucrose Agar - for use in the identification of viridans Streptococci.
6. Sucrose Phosphate Glutamate Media - for use in long term storage of Chlamydia.
7. Luria - Pertani plates - for use of selective organisms in DNA probe technology.
8. M - PA - C Agar - a selective media for Pseudomonas in Environmental Microbiology.
9. Regan Lowe Media - for the isolation of Bordetella pertussis.

During the year, we had a request from Manitoba Dental Health to provide services in the determination of effective sterilization of their Chemiclaves in Winnipeg and rural Manitoba. To this end, we recommended using Attest ampules according to manufacturers instructions and submitting them to our section for evaluation. This project has been on-going and appears to be of some assistance to Dental Health.

STERILIZATION

Cadham Provincial Laboratory decontaminates all their biohazard materials through this section. Protocol and procedures are continually updated to protect employees and the environment. Accidents are few and minor in nature, given the volumes processed daily.

This section prepares water bottle kits for the Environmental Microbiology Laboratory and Mailroom for use by Health Inspectors.

The staff in this section has remained stable for a number of years, providing continuous quality service to all areas of CPL. They are to be commended for their diligence and adaptability to new and varied projects.

VIRUS DETECTION

1989/90 was a banner year for respiratory viruses. Our winter respiratory season began with very early detection of influenza virus followed by a major outbreak in October - December 1989. Influenza virus isolates (H₃N₂) produced substantial morbidity in the community. Shortly after the influenza epidemic we experienced a major RSV outbreak which extended over many months through the end of the fiscal year. We have continued to expand the availability of rapid, mainly ELISA based, diagnostic methods for RSV detection. We now participate in the CDC Atlanta Respiratory Virus Surveillance Program and the Pacific Basin Influenza Virus Surveillance Program.

For enteric viruses, the section has been active in investigating the usefulness of enzyme immunoassay probes for adenoviruses and the characterization of enteric strains by restriction endonuclease analysis. In addition, we have continued to characterize the virus of the earlier Deer Lodge outbreak. We were invited to participate in a symposium on the diagnosis of enteric viruses at CDC Atlanta, which generated a useful consensus on the detection of these agents by electron microscopy. We have also been invited by CDC Atlanta to participate in a North American collaborative laboratory based surveillance system of rotaviruses and other enteric viruses detected by electron microscopy.

A major focus in recent years continues to be in the improvement and development of molecular probes for diagnostic virology. The polymerase chain reaction method (PCR) has been developed successfully for HIV-1 and papillomaviruses detection. This technology has opened the investigation of the role of papillomaviruses in the study of malignancy. Studies in the CPL have been able to provide very interesting information about detection of human papillomaviruses in prostate tissue, and particularly in cancer of the prostate.

The laboratory continues its involvement in collaborative studies of antiviral drugs in herpesvirus treatment. ELISA based antigen detection kits were evaluated for herpes simplex virus.

The role of cell culture remains very important in the section, and it is well supported by the tissue culture facilities.

See also Table 10-1.

INFECTION CONTROL PROGRAMS

This program is provided to assist rural hospitals and long term care facilities in the establishment of infection control programs and in the training of infection control practitioners. On-going consultation and continuing education services are included.

Ninety-seven (97) facility visits were made during which fifty-two (52) continuing education sessions were provided. Attendance totalled 694. Various infection control or infectious disease topics were presented.

Telephone consultations addressed a host of questions and numbered 389.

Five (5) two-day training courses were provided for twenty-eight (28) hospital and sixty-one (61) long care employees.

Mighty Microbes, an information bulletin continues to be popular. Long term care infection control practitioners received four (4) issues as did hospitals.

Miss Phippen remains active on the Health and Welfare Steering Committee on Infection Control Guidelines, the Working Group on the revision of Infection Control Guidelines, the St. Amant Centre Infection Control Committee, MACID-IC Sub-committee and CHICA-Manitoba.

RURAL LABORATORY AND X-RAY UNIT SYSTEM

The rural Laboratory and X-ray Services Unit System continued to provide diagnostic services in medical laboratory technology, radiology, diagnostic ultrasound, and electrocardiography, in 75 Manitoba health facilities.

LABORATORY EASTERN REGION

Quality Control Programs:

The Division continues to monitor and ensure quality of laboratory analyses by participating in the following internal and external Quality Assurance Programs.

Those offered by the Quality Control Section of the Cadham Provincial Laboratory:

- a. A Quality Control program for monitoring pregnancy testing and infectious mononucleosis testing.
- b. Microbiology - a comprehensive Gram staining, sensitivity testing and culture identification Quality Control program for the participating Laboratory and X-ray Units.

External Quality Control programs participated in are:

- a. Commercial Hematology control cells (internal program on all electronic cell counting apparatus).
- b. The Regional Hematology Quality Control program which includes the dissemination of whole blood samples on a defined area basis and subsequent collation of area statistics.
- c. Ames Urinalysis program.
- d. The Fisher Diagnostics "Accutrak": computerized chemistry quality control program monitors the chemistry program.
- e. All Units continue to participate in the College of American Pathologists Inter-laboratory Comparison program.
- f. All Units involved with Blood Bank Procedures are monitored by the Quality Control protocol developed and administered by the Canadian Red Cross.

New Activities:

Once again, there has been a major revision of the Consumable Supplies Catalogue as it relates to our Divisional Central Warehouse and distribution system. Many slow-moving and/or obsolete items have been deleted from the catalogue. Some new products have been added which reflect the changing technology in instrumentation.

A system has been developed toward a more streamlined approach for the procurement of certain consumable supplies which by-passes the Central Warehouse and places the consumer in direct communication with the supplier. This process reduces wastage of a number of time sensitive products.

The Division is in the planning process of on-site staffing of the Diagnostic Unit at Notre Dame.

We are continuing with the policy and procedure for off-site laboratory testing. This program offers a quality control process to any hospital for any process which is available to the hospital from our Laboratories. This quality control program monitors the off-site urine dip stick and glucose monitoring which are performed by hospital personnel on the hospital wards.

Upgrading of Systems:

Coulter Electronics Model T660 hematology microcell counters have been installed at the St. Pierre, Notre Dame and Eriksdale laboratories. This instrumentation has whole blood sampling capability and 6 simultaneous analyses are performed - hemoglobin, hematocrit, red cell count, white cell count, platelet counts and MCV.

The program of converting all of the laboratories to the use of safety centrifuges has now been completed.

Refrigerator/freezer functions were upgraded at Notre Dame and Emerson.

A semi-automated chemistry analyzer - Kodak Ektachem DT60 System, has been installed at Arborg and Pinawa. These systems have provided a quality clinical services for the smaller laboratory, offering a varied test menu with dry chemistry technology.

ToA Sysmex model K-1000 whole blood microcell counters have been installed at the Altona, Pine Falls, and Swan Lake laboratories. This instrumentation has whole blood sampling capability and 8 simultaneous parameters performed.

A Nova Stat Profile 3 blood gas analysis instrument was installed at the Portage laboratory. This measures blood pH, PCO₂, PO₂ and 7 other calculated parameters.

Centrifuges were upgraded at Selkirk, Morden and Gimli laboratories.

The laboratories at St. Pierre, Pine Falls, Swan Lake and Carman received a Ciba Corning ion selective analyzer.

A coag-a-mite XM coagulation timer was installed at the Morden laboratory. This unit operates on the photometric clot detection principle and is used in the performance of all routine coagulation tests.

Research and Development

Following the evaluation of 3 blood gas analyzers, the Nova Stat Profile 3 was chosen as the instrument of choice for the Portage laboratory.

Chemistry reagents from Syva (Theophyline) and Miles (uric acid) were evaluated at Portage la Prairie on the Cobas Mira.

B.D. Micro lancets and the Tenderfoot Pediatric Micro puncture devices were evaluated at the Portage laboratory.

Specimen mailing containers were evaluated at the Portage, Selkirk, The Pas and Flin Flon laboratories.

Latex and vinyl gloves from various manufacturers were evaluated at the Selkirk, Portage and Morris laboratories.

The Ciba Corning blood gas controls have been evaluated at the Selkirk laboratory.

The Terumo Capiject and Sarstedt microvette capillary blood collection systems have been evaluated at the Gimli and The Pas laboratories.

Construction and/or Renovations

Divisional staff were involved with Manitoba Health Services Commission Planning and Construction staff and various architectural groups over the past year.

Renovations have been completed at Notre Dame. Functional programs have been completed for Beausejour, Stonewall, St. Pierre and Altona. Construction of a new facility is in progress at Vita. Construction has been completed at Manitou.

LABORATORY WESTERN REGION

The fiscal year ending March 1990 saw the continued improvement and expansion of services in laboratories in the Western Region.

Instrumentation - Replacement and Upgrading

Fully automated hematology analyzers at Flin Flon, Roblin, Russell, Souris and Deloraine; new blood gas analyzers at The Pas and Dauphin; semi-automated electrolyte analyzer at Roblin; semi-automated chemistry analyzers at Birtle, Shoal Lake, Rivers, Carberry, Boissevain, Melita and Lynn Lake; semi-automated urine analyzers at Flin Flon, Swan River, Winnipegosis, Russell, Carberry, Boissevain, Crystal City and Souris; semi-automated hematology analyzers at Glenboro, Wawanese and Baldur.

With the introduction of these analyzers, many laboratories are now able to expand the scope of testing at the local level. Requests for

approval for additional procedures are now in progress and further requests will be submitted in the coming months.

Construction and Planning

A new laboratory was opened at Erickson providing an on-site technologist. Renovations to the Ste. Rose facility have been completed, adding much needed space to the laboratory. The new facility at Virden is to open services in the fall of 1990. Minnedosa should commence construction of their new facility during 1990. Renovations to the Roblin laboratory should be approved soon. Facilities at Swan River and Wawanesa are in the architectural design stage of development. Functional programs have been submitted for new facilities at Shoal Lake, McCreary and Carberry.

Laboratory Safety

New autoclaves were installed at Flin Flon, Ste. Rose, Erickson and Deloraine to decontaminate biological waste material before disposal. The divisional safety officer, Mr. Delaat, continues to instruct, inform and advise staff on safety procedures in the laboratory. The immediate concerns have been focussed on implementation of regulations dealing with hazards in the workplace and the transport of dangerous goods, mainly infectious materials. Safety centrifuges were installed at The Pas and Killarney.

New products are constantly evaluated to help reduce or eliminate hazards in the laboratory.

Continuing Education

The division again supported staff attendance at technical and life skills seminars, lectures and courses. Instruction was given to many staff on the use of their computers for in-house tasks using available programs. As more programs are made available, a broader application of the computer will result in a more efficient way of processing information.

RADIOLOGY, ECG AND ULTRASOUND EASTERN REGION

Ongoing Programs

A review and revisions were made of the Policy and Procedures Manual. Some notable topics addressed were "Confidential Information", "Freedom of Information Act", and Reinstatement Rules for CSLT and CAMRT Members.

Holter monitoring programs were set up at the hospitals at Swan Lake and Beausejour. LAXUS staff received training at the St. Boniface General Hospital.

The "Squibb Case-of-the Week" radiographic interpretation program was introduced to the Units during the year. The program involves a case history, radiographs and report of findings.

Radiographic Programs

The Division's program of capital equipment upgrading included the purchase of new radiographic equipment for the Notre Dame Unit. The Department is now equipped with a Transworld high frequency radiographic unit featuring floating top pedestal table, wall bucky, and an automatic exposure termination device.

New radiographic equipment was purchased in conjunction with the hospital construction program at Pembina-Manitou. The equipment includes the Gendex high-frequency generator, floating table top, wall bucky and automatic exposure termination.

Newly designed "straight line film transport" film processors were purchased for the communities of Stonewall, Treherne, and Lac du Bonnet.

A new mobile radiographic unit was purchased for the Portage Lab and X-ray Unit. It features a microprocessor controlled pulse charge capacitor type generator and includes the features of an ultrasound range finder and anatomical pre-programmed radiography.

ECG Program

The Division's activities were focussed on upgrading electrocardiographic machines. This has resulted in the purchase of five 3 channel interpretative machines for the towns of Gimli, Treherne, Pine Falls, Arborg and Winkler.

Single channel interpretative machines were purchased for Lac du Bonnet, MacGregor, Manitoba Developmental Centre, Emerson, and Altona. In addition, Burdick E 700 cardiac monitors were purchased for the Selkirk and Portage Units.

New Programs

Ultrasound

The Portage Laboratory and X-ray Unit began its new program of diagnostic ultrasound in June, 1989. The Department is operated by Mr. Grant Morgan under the direction of Dr. G. Evans. A wide range of examinations are performed. The equipment consists of the Elscint ESI 2000 model, the Matrix multifomat camera and various VCR's, monitors, and probes.

Planning and Construction

Divisional staff were involved with the Manitoba Health Services Commission Planning and Construction staff architectural firms, and project co-ordinators from various hospitals to assist in the development of new facilities.

Feasibility and functional programs have been established for hospitals and diagnostic facilities at St. Pierre, Stonewall, Altona, Notre Dame, Morris and Morden/Winkler.

Architectural planning has been approved for the Beausejour project.

Architectural planning and final approvals have been completed in preparation for construction in the summer of 1990 for the Vita and District Health Centre.

The Pembina-Manitou Hospital project is nearing completion with an official opening planned for June, 1990.

RADIOGRAPHY, ECG AND ULTRASOUND WESTERN REGION

The total number of examinations performed in the Western region in 1989-1990 fiscal year were as follows:

Radiography, 112,512 exams. Represents no change in comparison to last year.

Electrocardiography, 38,187 exams. Represents an increase of 4% activity over last year.

Ultrasound, 6,260 exams. Represents an increase of 13% over last year.

Provincial Lab & X-ray Services manages and operates the diagnostic services and facilities for the 37 rural hospitals in the western half of the province which includes, in part, as many ECG departments, four fully equipped ECG stress test labs and 48 X-ray rooms. These departments consist of 15 radiographic-fluoroscopic systems, one remote control radiographic, fluoroscopic and tomographic suite, two operating room systems, one panorex dental unit, three tomographic rooms and 25 general duty radiography rooms.

As part of fulfilling the on-going role of keeping these facilities current in technology, equipment, practices and programs we have, in the last year, been involved in continuing education, product, equipment evaluation and purchase, program evaluation and planning.

Continuing education sessions were held in Dauphin, involving 14 staff and 10 physicians from the Dauphin and Swan River areas and in Souris, with 21 staff attending from the Virden and Killarney areas. Sponsorship and presentations were provided by Siemens, Kodak and Squibb company representatives.

One commercial company provided "case of the week" pathology films for technologist and physician interest and education. Mrs. Jackie Fraas co-ordinated the program for the Dauphin area and Mr. Dennis Preston organized the program for the Westman area from his base in Russell. This project was found to be very popular with all participants.

Planning was completed in early 1989 for the first mobile ultrasound service in Manitoba. The Yellowhead Mobile Ultrasound service commenced operations on October 10, 1989, providing abdominal, gynecological, obstetrical and pelvic diagnostic ultrasound to hospitals in Russell, Minnedosa and Neepawa; with the headquarters being in Minnedosa. Service

to each site is on a weekly schedule. Grace Friesen is the technologist hired for the position, Dr. Garry Brooker is the Radiologist Consultant.

Nineteen (19) product evaluation reports were filed with the regional office on field trials carried out in the region on ECG equipment, Mortara Eli 100 and Eli 200, Nihon-Kohden 8240A, 8340A and 8110A, Siemens Sicard 440; and other equipment such as the Fuji FPM 3000 film processor and the images 14 compact film processor.

A number of comparison tests were carried out on films-screen combinations and films alone. One study compared Fuji G8, Konica KCI 400 and Curix Ortho regular intensifier screens in various combinations with Kodak OG, IBF Oref and Curix OG films. Fuji minc blue base and minc clear base multifilm camera film, Lafayette HD 85 and Polibar Baricum Enema contrast media were evaluated in comparison studies and E-Z EM company product E-Z paque large bowel contrast media, Kodak T-Mat grain film and Littman disposable electrocardiography electrodes were tested individually.

The major effects to date of these evaluations was the purchase of:

One Fuji FPM 3000 was installed in Killarney.
Mortara Eli 100 units were placed in Notre Dame and Altona (Eastern region).
One Mortara Eli 200 was purchased for Arborg (Eastern).
Nihon-Kohden 8340A full page, computer interpretive units were placed in Winkler (Eastern) and Neepawa.
Nihon-Kohden 8240A multichannel, 5.5", computer interpretive units were placed in MacGregor, Beausejour (Eastern) and Grandview.

Other purchases for this fiscal year as part of the on-going equipment upgrade program are:

One Marquette PC Ecgraph for Shoal Lake.
One Shimadzu Radiographic-fluoroscopic system with closed circuit TV for Deloraine. This system includes the UD 150 high frequency generator, YSF 200 Table with 14 x 14" spot film device and 3-field image amplification.
One Amerisys, formerly Elscint, general duty radiographic system with ceiling tube for Leaf Rapids. This installation is in concert with renovations to the facilities to improve patient amenities, workflow and radiation protection.

New hospital planning and construction activities for this year included:

Minnedosa - Drawings for a complete new facility were completed late in the fiscal year. This required concentrated planning activities due to this project being the first to try a new "fast-track" planning process which met its goal of shortening the time of the planning process. Construction is expected to take place in the 1990-91 fiscal year. The type of radiographic-fluoroscopic equipment is yet to be selected.

Virden - Construction for their new facility is on schedule and expected for completion in August 1990. A Shimadzu R/F system consisting of

the UD 150 K high frequency generator, YSF 200 Table and TV system are purchased as part of the project.

Erickson - With the opening of the new Erickson hospital facility, a new technologist position was established to operate the new diagnostic department. Mrs. Diane Koss from the Roblin department was appointed to this position October 16, 1990. The new department opened to the public for service in December 1989.

A computer subcommittee of the Supervisor's Advisory Committee was struck in 1989 to investigate and co-ordinate the activities involved with the introduction and applications of computerization to the provincial services. Members of the committee are Adrian Delaat, Dave Fotheringham, Judy Downey, Rod Pohl, Bill Strukoff and the Chairperson is Ed Carroll.

See also Tables 2 to 5.

EDUCATION

LABORATORY MEDICINE

Laboratory Medicine Education (LME) is administered and co-ordinated from the Cadham Provincial Laboratory for the entire Division by the Co-ordinator of LME.

Continued use was made of distant educational programs acquired from various sources. These programs may consist of a text, visual slides, audio-tapes, video-tapes or combination packs. Each program covers a specific topic related to laboratory medicine and may run up to one hour. The programs can be studied by individuals or in groups, at minimum cost to the Division, and at maximum convenience to the participants. During the year, 87 staff utilized these programs.

Dr. Williams, and invited specialists, continued the Division's on-site visitations. While at these visits, formal and informal presentations are delivered to rural physicians, technologists, auxillary staff and the public. Fifty-seven (57) such presentations were made on such topics such as: Respiratory Infections, Manitoba Parasites, Lyme Disease, Bacterial Toxins and their Clinical Significance, Allergens in the Environment and their Syndromes, The Allergic Child, Animal Diseases Affecting Man, Urinary Tract Infections, Radiological Diagnosis of Physically Abused Children, Diagnostic Serology-selected Problems, Antibiotic Review, Influenza, What's New in ID? In all 333 individuals attended: 207 physicians, 73 technologists and 51 others. The Division is highly appreciative of the contributions made by the visiting specialists.

Laboratory Assistantship Training

The Division continued to conduct a 12-week program to train selected Registered Radiological Technologists in basic laboratory medicine. In this program candidates receive four weeks intensive didactic training followed by eight weeks of guided practice in one of our rural Units. Six candidates graduated from this program. We are indebted to Donna Robbins and Pat Bird, who conducted a large part of the didactic program, and to the staff of the various Health Centres, who assisted us in the training of these students.

Inservice Training

This area of training is categorized in six distinct formats:

1. Reviews on routine procedures by on-line staff, particularly to new staff and to summer students.
2. Introduction of new tests or instruments. This may involve:
 - a. Familiarization by a sales representative or senior staff.
 - b. A pre-test as a guide to basic relevant knowledge.
 - c. Practice under supervision and guidance of an instructor.
 - d. A practical test to demonstrate procedural competence.

- e. A post-test to demonstrate an understanding of principles, applications and pitfalls.
3. Lectures or seminars presented by senior staff or invited guests. These are usually broad topics of interest to all or several laboratory sections.
4. Presentation and review of current articles by designated staff members.
5. Short programs that are sent to individuals or groups, and that can be learned on-site without help from an instructor.
6. Formal programs that require indepth involvement and longer time commitments from both the participant and an instructor - e.g., re-training staff.

Specific activities under categories 2, 3, and 4 are listed below. The numbers in brackets represent the number of staff in attendance at the respective session. All were one hour each unless otherwise indicated:

CPL Seminars:

- Progress in Detection of HIV-I - M. Dawood (39)
- Health Industry Initiative - I. Blicq, ADM, MB Industry, Trade and Tourism (56)
- Divisional Dialogue: What is the Family - G. Hammond (90)
- Strategies for Lipid Testing in Manitoba - J.G. Fox, D. Gelskey (49)
- Bone Marrow Transplantation and its Complications - T. Shore, Oncologist, St. Boniface Hospital (51)
- Verotoxin in Manitoba, Clinical and Foodborne - L. Sekla and T. Williams (47)
- Screening Mammography - D. MacEwan (53)

Other CPL Sessions:

- Detection of Enterohemorrhagic E. coli in Ground Beef - D. G. Milley (25)
- Evaluation of a Commercial Enzyme-linked Immunosorbent assay for the rapid detection of Herpes simplex virus - G. S. Ahluwalia (24)
- Two Basic Safety Seminars - 1 1/2 hrs. - A.N.C. Delaat (18)
- *Listeria monocytogenes*: An important foodborne pathogen - P. Pugh (21)

Other CPL Sessions (cont'd)

- Mainframe Computer Seminar, twice - S. vanCuylenburg (36)
- Lyme Disease - W. Stackiw (28)
- Papillomavirus - P. McNicol (25)
- Detection of Verotoxin - A.C. Maniar (23)
- Neonatal TSH - R. Thompson (21)
- Telemedicine Conferences - several (78)
- Detection of HIV Genome using the PCR technique - M. Dawood (26)
- Eight Journal Review Seminars, Various topics by various staff (168)

Rural Sessions:

- Introduction to WHMIS - 2 hours (by Area Chiefs to Rural Staff) (178)
- Transportation of Dangerous Goods - 1 hour
(by Area Chiefs to Rural Staff) (178)
- CPR Re-certification - Swan River (11)
- Performance Appraisal - 6 hours - Swan River (2)
- Introduction to Computers - 36 hours - Selkirk -
Angie Banmann and Louise Blahitka (2)
- Introduction to Computers - most locations, 1 d various conveners,
as co-ordinated by Mrs. J. Matthews (120)

Extramural Training for the Division

Several staff members received assistance to partake in extramural training programs, or supported themselves in such activities.

- St. John Ambulance Emergency level First Aid: Barbara Wells, (5)
Janice Drummond, Cathy Hooze, Dean Sigurdson, Anita Wiecek
The last three also completed Cardio Pulmonary Resuscitation (3)
- Attendance at Winnipeg Academy Action, 1 d (36)
- MHO Conference - Winnipeg - 1 d - November (19)
- Certificate in Medical Laboratory Sciences, UM, several staff
completed various courses, 30 h/c (9)
- Inservice on Kodak DT 60, 1 d by Kodak Rep. (3)

- Workplace, Safety Health Seminar, 2 d, Banff -
Rob Krezansky - MGEA delegate (1)
- Coulter T Series Workshop, 8 hr -
Wendy Chen and Carolyn Brady, Pinawa (2)

Extramural Teaching from the Division

A number of our staff continued to contribute a significant amount of their time to teaching at the University of Manitoba Medical and Dental Faculties. These activities include lecturers, seminars, tutorials, rounds and laboratory sessions in a variety of health-related programs.

Some entire courses are co-ordinated by Division staff:

Radiology 103.114 - Faculty of Dentistry and Radiology 70:212 -
School of Dental Hygiene, Dr. D. Gelskey - Co-ordinator and
Instructor.

Clinical Parasitology 97.714 - University of Manitoba - Health
Sciences Centre - Dr. L. Sekla - Co-ordinator and Instructor.

Two graduate students were being supervised by our staff:
Mr. T. Scott-Taylor, M.Sc. student by Dr. G. Hammond and
Mrs. R. Kilani, Ph.D. student by Dr. L. Sekla.

Several other post-graduate students, residents and fellows rotated
through various departments of the CPL for varying periods of time:

Mark Tyndall - Infectious Disease Rotation
David Odour - Special Fellow from Kenya - 3 months
Bill Thompson - Infectious Disease Rotation
Barry Miller - Community Medicine Rotation
Lilly Kozody - RT - Subject Rotation

Lab rounds are a weekly feature at the CPL, and review the medical
use of diagnostic technology, specimen collection, and test interpretation.
Thirty (30) rounds were conducted at the CPL for infectious disease
fellows, residents, interns and medical students. The rounds were
presented by: Messrs. Stackiw, Klisko, Koschik, Ahluwalia, Szajkowski and
Milley, Drs. Maniar, McNicol, Mrs. Eibisch, Dzogan, Winther, Stockl, Bird,
Giercke, Drummond, Parsley and Miss Pugh, Lutyj.

Some other activities of note:

- Presentation to Wpg. South Public Health Nurses, A.J. Norrie and Kathy
Kines.
- Presentations to Federal Nurses - Orientation - A.N.C. Delaat and
D. Phippen.
- McNicol, P., Invited Lectures:
 - Application of PCR to Diagnosis of Infectious Diseases. Manitoba
Society of Clinical Chemists. Winnipeg.

- New Life for Old Tissues. Department of Pathology, University of Manitoba.
- The Role of Molecular Biology in HPV Diagnosis. Canadian Public Health Association. 80th Annual Conference. Winnipeg.
- Diagnostic Biotechnology - Principles, Procedures and Promises. CSLT Academy Action. Winnipeg.
- Diagnostic Biotechnology - Probes, Primers and Future Prospects. Manitoba Health Organization. 20th Annual Conference. Winnipeg.
- The Association of Human Papillomavirus with Genital Cancers. Laboratory Centre for Disease Control. Ottawa, Ontario.
- Presentation to Graduates of the UM Certificate in Medical Laboratory Sciences, A.N.C. Delaat.
- QA/QC Presentation to MHSC and CP&S Reps. D. Sirett and M.W. Burroughs.
- STD Training to Provincial and City of Winnipeg Public Health Nurses - several sessions - various staff participants, 1990-03-21, 1989-04-17, 1989-06-29.
- Discussions on Ultrasound - T.V. Guest, Julie Hay
- Fifty (50) Water and Waste students visited the CPL, focussing on Environmental Microbiology. Conveners were Mr. Stackiw, Mr. Milley, Ms. Pugh and Mrs. Winzinowich, February 1990.
- Introduction to CPL: St. Boniface Hospital School of Med. Technology, A.N.C. Delaat

Abstracts Presented

1. Guijon, F., McNicol, P., Heywood, E., Gray, M. and Brunham, R., 1989. Effect of menstrual cycle on detection of HPV in uterine cervical cells. 8th International Papillomavirus Workshop, Taos, New Mexico, USA.
2. McNicol, P., Wasylyshen, D. and Dodd, J.G., 1989. Polymerase chain reaction amplification of HPV genomic sequences in the human prostate gland. 8th International Papillomavirus Workshop, Taos, New Mexico, USA.
3. Guijon, F.B., Brunham, R., Paraskevas, M. and McNicol, P., 1989. Vaginal microflora as a cofactor in the pathogenesis of Human Papillomavirus induced cervical neoplasia. 10th Annual Meeting of the Society of Obstetricians and Gynecologists of Canada. Quebec City, Quebec.
4. Becker, A., Roberts, J., Watson, W. Warrington, R., Simonds, L., Gendreau-Reid, L. and Sekla, L., 1989. Phadiatop: Predictive Value for Allergy Consultation? Royal College Meeting, September.

5. Aoki, F., Sekla, L., Pitch, S., Peters, H., Golembioski, J., Dela Cruz, Z., 1989. Immunogenicity and adaptability of Influenza vaccine administered at hospital discharge. Royal College Meeting, September.
6. Hammond, G., Buchanan, D., Malazdrewicz, K., Tate, R., Sekla, L. Seroprevalence and demographic results of IVU among individuals at risk for HIV infection in community based study in Winnipeg, Manitoba, Canada. 5th International Conference on AIDS, Montreal, Quebec.
7. Dyck, B., Nicolle, L., Louie, M., Parker, S., Sekla, L., 1989 Prospective surveillance of Legionnaire's disease in an acute care hospital. Toronto CHICA Poster Presentation.
8. Louie, M., Dyck, B., Parker, S., Sekla, L., Nicolle, L., 1989. Nosocomial pneumonia at a Canadian care tertiary centre. ICAAC.
9. Sekla, L., Stackiw, W., Smart, G., Eibisch, E., Poffenroth, L., and Roberts, A., 1989. Lyme Disease in Manitoba. 57th Conjoint Meeting on Infectious Diseases, Montreal, Quebec, November 27 - 28.
10. McGill, M., Yassi, A., Sekla, L., 1989. Levels of Anti HBs in hospital workers vaccinated against Hepatitis B. 57th Conjoint Meeting on Infectious Diseases, Montreal, Quebec, November 27 - 28.
11. Maniar, A., Williams, T., Hammond, G.W., Anand, C.M., 1989. Detection of verotoxin from stool specimens. American Society for Microbiology Annual Meeting, New Orleans, Louisiana, May 14-18.
12. Maniar, A., Williams, T., Hammond, G.W., 1989. Duration of excretion of mutagens in urine of patients receiving anti-neoplastic drugs. American Society for Microbiology Annual Meeting, New Orleans, Louisiana, May 14-18.
13. Hammond, G., Malazdrewicz, R., Tate, R., Bhayana, V., Elmlie, K., 1989. Lack of impact of HIV counselling on women with STD checkups to alter the likelihood of subsequent STD visits. Vth International Conference on AIDS, Montreal, Quebec, June 4-8.
14. Maniar, A.C., Williams, T.W., Hammond, G.W., Johnson, N., and Kobrinsky, N.L., 1989. Duration of excretion of mutagens in the urine of children receiving anti-neoplastic drugs. First Annual Meeting of the American Society of Pediatric Hematology/Oncology, Chicago, Illinois, September 15-17.
15. Dawood, M., Fowke, K, and Hammond, G.W., 1989. Detection of HIV-1 by the amplification of specific regions of regulatory and structural genes using the polymerase chain reaction. Canadian Society of Microbiologists. Annual meeting 1989 Reunion.

Career Counselling and Development

- Stonewall Collegiate - A.N.C. Delaat, April 1989.

- Manitoba School Science Symposium - P. Bird, A.N.C. Delaat, April 1989
- Mark Fiola and Julie Legal from The Seine River School Division spent a week each at the CPL to explore their career options.
- McGregor Collegiate - D. Fotheringham.
- The Grade 10 Biology Class of St. John's Ravenscourt was given a special guided tour as a career orientation.

Radiology

R.T. Training

The Manitoba Health Services Commission X-ray Training School continued its program of training candidates for registration with the Canadian Association of Medical Radiation Technologists. The program involves 25 months of X-ray training plus three months of Laboratory Assistant Training.

Five (5) candidates passed registration examination. Also, 3 senior students are progressing successfully through the clinical portion of the program in both rural and city hospitals.

Five (5) junior students are currently enrolled in the theoretical portion of the program at Red River Community College, and are doing extremely well.

The program consists of 2 four-month blocks of theory at RRCC, separated by one month of clinical experience in a rural hospital. The final block of theory is followed by return to the rural hospitals for fifteen (15) months of second year clinical training. In addition, 2 former X-ray R.T.'s were retrained in order to be re-instated with their professional association.

X-ray Assistant Training

The Lab & X-ray Unit System sponsors selected Registered Medical Laboratory Technologists in a four month X-ray Assistant Training Program. This course is designed to train individuals to assist Radiological Technologists in covering emergency call-back situations in smaller rural hospitals. Five (5) students successfully completed the 1988 program.

Continuing Education

A number of inservice seminars, and workshops as well as extramural lectures and conferences were attended by Divisional staff.

The following topics were covered at the respective locations with the figures in brackets representing the number of individuals in attendance.

Radiography

Brandon

- Image Quality in Chest Radiography - 1 hour (11)
- Professionalism and Continuing Education - 1 hour (11)
- Dealing with Schizophrenic Patients - 1 hour (11)
- Management of Arthritis - 1 hour (11)
- "Tisher Test" Video - 1 hour (11)
- New Developments in Technology:
 - Digital Imaging - 30 minutes (11)
 - Lithotripsy - 30 minutes (11)
 - Magnetic Resonance - 30 minutes (11)

Dauphin

- Mammography - 1 hour (24)
- Contrast Media - 1 hour (24)

Gimli

- Handling of Trauma Patients - 30 minutes (10)
- Use of Radiography Accessories - 30 minutes (10)
- Demonstration of Abdominal Fluid Levels - 30 minutes (10)
- Quality Assurance - 30 minutes (10)

Pinawa

- Skull Sinus, Facial Bones Radiography - 2 hours (9)

Swan River

- Mammography - 1 hour (2)
- Contrast Media - 1 hour (2)
- Open House Lectures and Tours - 1 afternoon (8)

Winnipeg

- Laser Imaging in the 90's - 3 hours (6)

St. John's, Newfoundland

- Many topics - 5 days (1)

R.S.N.A., Chicago

- Many lecture topics and product evaluation on equipment for radiology, ultrasound and mammography (3)

Electrocardiography

Several technologists attended training sessions on the Holter monitor and other related lectures.

Also, several technologist pursued the self-study program and wrote the National Certification examination.

Safety and Health

One of the major thrusts over the past year was the introduction of WHMIS to our Divisional Staff. This introduction was facilitated by new and updated Safety Manuals for Radiography and Laboratory, both compiled by our Divisional Safety Officer, Mr. Delaat. We pride ourselves in having WHMIS practices in place throughout LAXUS, well ahead of most other providers of similar services.

Distinguished Visitors to CPL

Dr. M. Watanabe, Dean, Faculty of Medicine, U. of Calgary. Met with senior staff to discuss: Utilization of Health Services, with a focus on Diagnostic Imaging.

Dr. I. Wamola, Head, Department of Medical Microbiology, University of Nairobi. Met with senior staff to explore how the CPL may assist in the development of his professional staff, particularly in the area of Clinical Virology.

Dr. C. Scriver, Head, McGill University - Montreal Children's Hospital Research Institute. Delivered the fourth J. C. Wilt Lecture entitled: Public Health and Genetic Screening.

EXTERNAL COMMITTEE ACTIVITIES OF STAFF - 1989/1990

Many of our staff members serve on various health related committees by providing advisory, consultative or executive functions:

- | | |
|---------------------|--|
| Mrs. P. Bird | - Treasurer - Manitoba Society of Medical Laboratory Technologists |
| Mr. J. D. Brownlee | - Parliamentarian - Manitoba Association of Medical Radiological Technologists |
| | - Secretary - Faculty Liaison Committee |
| Mr. M. W. Burroughs | - Member - Medical Radiological Technology Advisory Committee, Red River Community College |
| | - Secretary - Provincial Ultrasound Advisory Committee |
| Mr. A.N.C. Delaat | - Continuing Education Director - Manitoba Society of Medical Laboratory Technologists |
| | - Chairman - Steering Committee - Degree in Medical Laboratory Sciences in Manitoba |
| | - Member - Advisory Committee - Medical Laboratory Sciences Certificate Program - University of Manitoba |
| Dr. J. G. Fox | - Chairman - Perinatal Screening Committee |
| | - Member - Alpha Feto Protein Consultant's Group |
| | - Member - Biohazard Committee |
| | - Member - Manitoba Advisory Committee on Infectious Diseases (MACID) |
| Dr. D. Gelskey | - Chairman - Education Committee, Manitoba Heart and Stroke Foundation |
| | - Member - Grant Screening Committee, Manitoba Cancer Society |
| | - Member - Manitoba Hypertension Coalition Steering Committee |
| | - Member - Undergraduate of Medical Education Committee, University of Manitoba |
| | - Member - Working Committee for World Health Organization Collaborating Center, University of Manitoba |

- | | |
|-----------------------------------|--|
| Dr. D. Gelskey
cont'd | - Chairman - Hypertension Action Plan Working Committee |
| Mrs. S. Giercke | - Membership Director, Manitoba Society of Medical Laboratory Technologists |
| Ms. T. Greenlay | - Director - Manitoba Association of Cardiology Technologist |
| Dr. G. W. Hammond | - Member - National Advisory Committee on Immunization |
| | - Member - Technical Advisory Committee and Chairman of the Subcommittee on Reference Services to Laboratory Centre for Disease Control, Ottawa |
| | - Member - Specialty Committee in Medical Microbiology, Royal College of Physicians and Surgeons of Canada |
| | - Member - Manitoba Advisory Committee on Infectious Diseases |
| | - Member - Awards Assessment Committee, Manitoba Medical Services Foundation Inc. |
| | - Ad Hoc Member, Minister's Advisory Committee on AIDS, Manitoba |
| | - Member - Executive Council, Canadian Infectious Disease Society |
| Dr. P. McNicol | - Member - National Committee for Human Papillomavirus Research, Health & Welfare, Canada |
| | - Member - Infectious Diseases Subject Committee, University of Manitoba |
| | - Co-ordinator, Infectious Diseases Program, Med I, University of Manitoba |
| Mrs. S. Normand
Mrs. A. Norrie | - Members - Advisory Council, Medical Laboratory Technology Program - Red River Community College |
| Mrs. A. Norrie | - Chairman - Scientific Program Committee Academy Action, MSMLT |
| Ms. D. Phippen | - Steering Committee for Infection Control Guidelines. Bureau of Communicable Disease Epidemiology, Laboratory Centre for Disease Control, Health & Welfare Canada |

Ms. D. Phippen
(cont'd)

- Member - Manitoba Advisory Committee on Infection Control - Infection Control Subcommittee
- Community and Hospital Infection Control Association (CHICA) - Manitoba
- St. Amant Centre - Infection Control Committee

Dr. L. Sekla

- Preventive, Environmental & Occupational Health, Manitoba Medical Association
- Senior Health Official, Environmental Health Protection, Health and Welfare Canada
- Member - Manitoba Advisory Committee on Infectious Diseases

Mr. W. Stackiw

- Animal Care Committee, University of Manitoba

Mrs. E. Stockl

- Member - Maternal Serum AFP Advisory Group and Working Committee

Mr. R. Thompson

- Member - Maternal Serum AFP Advisory Group

Dr. T. Williams

- Member - Manitoba Advisory Committee on Infectious Diseases
- Member - Program Review Committee, CP&S
- Member - Standing Committee on Medical Manpower - MHSC

PUBLICATIONS (1989/90)

1. Dawood, M. R., Howes, N. K., and Bushuk, W. 1989. Preparation of monoclonal antibodies against specific gliadin proteins and preliminary investigation of their ability to discriminate cereal cultivars. *J. Cereal Sci.* 10:105-112.
2. Delaat, A.N.C., 1990. How to prepare a case study. *News Bulletin, CSLT*, March.
3. Guijon, F., P. McNicol, E. Heywood, M. Gray, and R. Brunham. 1989. Effect of menstrual cycle on detection of HPV in uterine cervical cells. In: *Papillomaviruses*. P. Howley and T. Broker ed., A. R. Liss, Inc., New York.
4. Hammond, G. W., Raddatz, R. L., Gelskey, D. E. 1989. Hypothesis: Impact of atmospheric transport of viral aerosols on the epidemiology of influenza. *Rev. Infect. Dis.* 11(3):494-497.
5. Howes, N. K., Kovacs, M., Dawood, M. R., Leisle, D., and Bushuk, W. 1989. Rapid detection of the IBS/IR chromosome translocation in hexaploid wheat by monoclonal antibodies. *J. Cereal Sci.* 10(1):1-4.
6. Howes, N. K., Kovacs, M., Dawood, M. R., Leisle, D., and Bushuk, W. 1989. Screening of durum wheats for past making quality with monoclonal antibodies for gliadin. *Genome* 32:1096-1099.
7. Jay, F. T., Dawood, M.R., and Luk, S. K. S. 1989. Infectivity deficient vesicular stomatitis virus produced in the presence of interferon have functional virion core. *Can. J. Micro.* 35:334-339.
8. McNicol, P., D. Wasylyshen, and J. Dodd. 1989. Polymerase chain reaction amplification of HPV genomic DNA in the human prostate gland. In: *Papillomaviruses*. P. Howley and T. Broker ed., A. R. Liss, Inc., New York.
9. McNicol, P. J., and J. G. Dodd. 1990. Detection of human papillomavirus DNA in prostate gland tissue using the polymerase chain reaction amplification assay. *J. Clin. Microbiol.*, 28:409-412.
10. McNicol, P., Guijon, F., Paraskeva, M., Heywood, E., Gray, M, and Brunham, R. Effective of the menstrual cycle on detection and typing of Human Papillomavirus in uterine cervical cells. *Am. J. Obstet. Gynecol.* (in press)
11. McNicol, P. J. and Dodd, J. G. Detection of human papillomavirus in human prostatic tissue by southern blot analysis. *Can. J. Microbiol.* (in press).
12. McNicol, P. J., 1989. Papillomavirus Genital Infections - Oncogenic STD? *Antiviral Update.* 3:6.
13. McNicol, P., 1989. Genital warts; More common than AIDS. *Today's Health.* Daycal Publishing Inc. Toronto. 7:31-34.

14. Maniar, A. C., Williams, T. W., and Hammond, G. W. 1990. Detection of Verotoxin in Stool Specimens. *J. Clin. Micro.* 28(1):134-135.
15. Musser, J. M., Kroll, J. S., Granoff, D. M., Moxon, R. E., Brodeur, B. R., Campos, J., Dabernat, H., Frederiksen, W., Hamel, J., Hammond, G., Hoiby, E. A., Jonsdottir, K. E., Kabeer, M., Kallings, I., Khan, W. N., Kilian, M., Knowles, K., Koornhof, H. J., Law, B., Li, K. I., Montgomery, J., Pattison, P. E., Piffaretti, J.-C., Takala, A. K., Thong, M. L., Wall, R. A., Ward, J. I., Selander, R. K. 1990. Global genetic structure and molecular epidemiology of encapsulated *Haemophilus influenzae*. *Rev. Infec. Dis.* 12(1):75-111.
16. Sekla, L., Hammond, G. W. 1989. Results of serological testing for HIV infection in Manitoba. *CDWR* 15-20:105-108.

Table 1 Cadham Provincial Laboratory Workload Statistics 1987-89

SECTION	1987/88			1988/89			1989/90		
	NO. OF SPECIMENS	NO. OF TESTS	STATISTICS - CANADA UNITS	NO. OF SPECIMENS	NO. OF TESTS	STATISTICS - CANADA UNITS	NO. OF SPECIMENS	NO. OF TESTS	STATISTICS - CANADA UNITS
Clinical Microbiology	113,156	138,833	2,219,927	116,242	145,107	2,320,921	116,675	148,463	2,416,970
Media	N/A	N/A	331,366	N/A	N/A	361,906	N/A	N/A	369,699
Virus Detection	13,501	18,124	665,482	14,709	20,231	818,639	14,819	20,224	863,670
Environmental Microbiology	47,746	78,790	1,482,387	46,539	80,819	1,348,201	46,283	81,432	1,246,761
Serology/Parasitology	100,905	242,759	3,801,444	94,797	221,647	3,459,289	87,615*	218,182*	3,395,371*
Metabolic/Chemistry	59,742	214,096	1,150,635	68,245	239,948	1,313,644	86,197	267,515	1,457,124
TOTALS	335,050	692,602	9,651,241	340,532	707,752	9,622,600	351,589	735,816	9,379,896

NOTE: Serology* - 20,200 Prenatalology PM Hepatitis Tests:
Hepatitis Tests were run 20,026

TABLE 2

 VEHICLES OF RURAL LAW & T-RAY WHITE SYSTEM - APRIL 1, 1989 - MARCH 31, 1990
 TOTAL SC CONCENTRATIONS

UNIT	TOTAL	IN/PAT	Q/PAT	TOTAL	IN/PAT	Q/PAT
BRIMLEY	1067	384	783	29482	11284	18278
BRITTON	715	255	460	20118	7928	12192
BRIMLEY	709	194	515	19988	6268	13622
BRIMLEY LAKE	571	221	350	16414	7138	9284
BRIMLEY	6494	2444	4050	189878	80977	108901
GILBERT PLAINS	136	0	136	3536	0	3536
GRANDVIEW	388	187	201	11024	3526	7498
ROCHESTER	336	56	281	9072	1718	7354
ROCHESTER	1486	433	1053	54196	26362	27834
ST. JOHN	1234	411	823	35100	12894	22206
ST. JOHN	456	284	172	13264	4582	8672
ST. JOHN	2534	907	1627	71840	28138	43702
ST. JOHN	924	284	640	28037	9088	18949
ST. JOHN	344	134	210	9740	3452	6288
ST. JOHN	744	277	467	20224	8010	12214
ST. JOHN	763	306	457	22007	9136	12871
ST. JOHN	3374	1110	2264	94425	33144	61281
ST. JOHN	184	28	156	4968	912	4056
ST. JOHN	340	240	0	6240	6240	0
ST. JOHN	187	76	111	5262	2320	2942
ST. JOHN	288	58	230	7634	1644	5990
ST. JOHN	327	125	202	9382	4114	5268
ST. JOHN	1070	482	588	30897	14253	16644
ST. JOHN	193	129	64	6050	4386	1664
ST. JOHN	780	237	543	20628	7461	12967
ST. JOHN	63	4	59	1658	136	1522
ST. JOHN	561	240	321	16082	7854	8228
ST. JOHN	1031	404	627	29798	13496	16302
ST. JOHN	556	301	255	16864	10234	6630
ST. JOHN	1774	584	1190	48620	19168	29452
ST. JOHN	706	199	507	24494	8172	16322
ST. JOHN	1451	575	876	39919	17512	22407
ST. JOHN	129	30	99	3594	1030	2574
ST. JOHN	300	78	222	8424	2652	5772
ST. JOHN	900	391	509	30114	15870	14244
ST. JOHN	1232	221	1011	31807	5596	26211
ST. JOHN	1202	434	768	28462	19494	9168
ST. JOHN	2721	942	1779	81438	28182	53256
ST. JOHN	819	408	411	23633	12617	11016
ST. JOHN	655	0	655	17030	0	17030
ST. JOHN	413	201	212	12490	6752	5738
ST. JOHN	966	447	519	27036	13542	13494
ST. JOHN	277	277	0	7534	7534	0
ST. JOHN	163	62	101	4228	1612	2626
ST. JOHN	2147	809	1338	57436	22940	35196
ST. JOHN	96	29	67	2534	748	1786
ST. JOHN	1978	578	1400	58132	19420	38712
ST. JOHN	434	195	239	12956	6374	6582
ST. JOHN	122	0	122	4140	0	4140
ST. JOHN	1100	205	895	30935	6961	23974
ST. JOHN	763	361	402	22006	11554	10452
ST. JOHN	1209	315	894	33662	10654	23008
ST. JOHN	861	286	575	24082	9124	14958
ST. JOHN	440	159	281	12824	5246	7578
ST. JOHN	329	55	274	9098	1758	7340
ST. JOHN	1688	550	1138	48443	18760	29683
ST. JOHN	602	338	264	18660	11364	7296
ST. JOHN	333	82	251	8658	2132	6526
ST. JOHN	353	176	177	10074	5344	4730
ST. JOHN	3103	714	2389	89950	24776	65674
ST. JOHN	151	52	99	4174	1600	2574
ST. JOHN	343	117	226	9494	3885	5609
ST. JOHN	137	17	120	3864	568	3296
ST. JOHN	157	61	96	4202	1698	2504
ST. JOHN	613	399	214	17358	11794	5564
ST. JOHN	741	381	360	21258	11746	9512
ST. JOHN	114	13	101	2996	370	2626
ST. JOHN	2766	750	2016	78970	25500	53470
ST. JOHN	0	0	0	0	0	0
ST. JOHN	3308	1288	2020	100391	38436	61955
ST. JOHN	826	176	650	22884	9884	16900
ST. JOHN	478	104	374	13190	3232	9958
TOTAL SC EXAMS	67277			TOTAL SC SC EXAMS	1915204	
TOTAL SC IN/PAT EXAMS	24191			TOTAL SC SC IN/PAT	751128	
TOTAL SC OUT/PAT EXAMS	43086			TOTAL SC SC OUT/PAT	1164076	

TABLE 3

WORKLOAD OF RURAL LAB & X-RAY UNITS SYSTEM - APRIL 1, 1989 - MARCH 31, 1990

UNIT	TOTAL RGS EXAMINATIONS			TOTAL R.C. UNITS		
	TOTAL	IN/PAT	Q/PAT	TOTAL	IN/PAT	Q/PAT
ARMHILL	1067	364	703	29482	11204	18278
BIRYLE	715	285	440	20118	7926	12192
BONHOMME	709	194	515	19890	6268	13622
BONAL LAKE	571	221	350	16414	7130	9284
DAUPHIN	6494	2666	4028	189878	80977	108901
GILBERT PLAINS	136	0	136	3536	0	3536
GRANDVIEW	386	107	281	11024	3526	7498
HOCHEMY	336	56	281	9072	1718	7354
HOMER	1886	833	1053	54196	26362	27834
ST. HUB	1234	411	823	35100	12694	22406
WINDYBROOKS	456	284	172	13264	8592	4672
KEEFMA	2534	907	1627	71840	28138	43702
CARRISBY	924	284	640	26037	9088	16949
ELICKSON	366	134	232	9740	3452	6288
GLADSTONE	744	277	467	20224	8010	12214
KIMBERG	763	306	457	22007	9136	12871
PORTAGE	3374	1110	2264	96825	33164	63661
WACONIA	184	28	156	4968	912	4056
N.D.C.	240	240	0	6240	6240	0
NOTRE DAME	187	76	111	5262	2320	2942
ST. CLAIR	288	58	230	7624	1644	5980
TREHUNE	327	125	202	9382	4114	5268
KILLARNEY	1070	482	588	30597	14253	16344
BALDWIN	193	129	64	6050	4386	1664
BOISEVALE	780	237	543	20628	7661	12967
CARTWRIGHT	63	4	59	1658	136	1522
CRYSTAL CITY	561	240	321	16082	7856	8226
DELOMAR	1031	404	627	29798	13496	16302
HELITA	556	301	255	16864	10234	6630
HERDIN	1774	584	1190	48620	19168	29452
ALTON	706	198	507	24494	8172	16322
CANNON	1451	575	876	39919	17512	22407
DERGON	129	30	99	3594	1020	2574
HANITON	300	78	222	8424	2652	5772
HERRIS	900	391	509	30114	15870	14244
SHAW LAKE	1232	221	1011	31807	5596	26211
WINKLER	1202	834	368	28462	19494	9168
SELENE	2721	942	1779	81438	28182	53256
BEAULIEUX	819	408	411	23633	12617	11016
LAC DU BONNET	655	0	655	17030	0	17030
PINDAR	413	201	212	12490	6752	5738
PIRE FALLS	966	447	519	27036	13542	13494
SILKIN R.N.C.	277	277	0	7534	7534	0
WHITEFOOT	163	62	101	4238	1612	2626
SABE RIVER	2147	809	1338	57436	22240	35196
DEWITO	96	29	67	2534	748	1786
GIDLI	1978	578	1400	58132	19420	38712
KRISDALE	434	195	239	12956	6374	6582
RIVINGTON	122	0	122	4140	0	4140
STONEMALL	1100	205	895	30935	6961	23974
TEULON	763	361	402	22006	11554	10452
VINDEN	1209	315	894	33662	10654	23008
HANIOYA	861	286	575	24082	9124	14956
RESTON	440	159	281	12824	5246	7578
RIVERS	329	55	274	9098	1758	7340
SCORIS	1688	550	1138	48443	18760	29683
ARBORG	602	338	264	18660	11364	7296
ASHER	333	82	251	8658	2132	6526
CHURCHILL	353	176	177	10074	5344	4730
FLIN FLON	3103	714	2389	89950	24276	65674
GILLAN	151	52	99	4174	1600	2574
GLENDORA	343	117	226	9494	3885	5609
LEAF RAPIDS	137	17	120	3864	568	3296
LYNN LAKE	157	61	96	4202	1698	2504
ST. PIERRE	613	399	214	17358	11794	5564
ST. ANNE	741	381	360	21258	11746	9512
SNOW LAKE	114	13	101	2996	370	2626
STEINBACH	2766	750	2016	78970	25570	53470
SUNDANCE	0	0	0	0	0	0
THE PAS	3308	1288	2020	100391	38436	61955
VITA	826	176	650	22884	5984	16900
WINDYBROOKS	478	104	374	13190	3232	9958

TOTAL RGS EXAMS- 67277
 TOTAL RGS IN/PAT EXAMS 24191
 TOTAL RGS OUT/PAT EXAMS 43086

TOTAL RGS SC UNITS- 1915204
 TOTAL RGS SC IN/PAT- 751128
 TOTAL RGS SC OUT/PAT- 1164076

TABLE 4

WORKLOAD OF RURAL LAB & X-RAY UNITS SYSTEM							
TOTAL ULTRASOUND EXAMS APRIL 1/89 - MARCH 31/90				TOTAL US S.C. UNITS APRIL 1/89 - MARCH 31/90			
UNIT	TOTAL	IN/PAT	O/PAT	TOTAL	IN/PAT	O/PAT	
DAUPHIN	2876	371	2505	124972	16823	108149	
PORTAGE	1251	143	1108	53458	6354	47104	
SELKIRK	2581	181	2400	111873	8405	103468	
STEINBACH	1668	91	1577	67202	3859	63343	
SWAN RIVER	151	12	139	8452	714	7738	
THE PAS	2316	318	1998	95858	13633	82225	
WINKLER	2965	160	2805	150242	6872	143370	
FLIN FLON	130	6	124	5585	233	5352	
MIDWEDOSA	256	14	242	10593	723	9870	
RUSSELL	231	18	213	10374	950	9424	
NEEPAWA	300	38	262	13441	2005	11436	
TOTAL US EXAMS =				14725	TOTAL US SC UNITS=		652050
TOTAL US IN/PAT EXAMS=				1352	TOTAL US SC UNITS IN/PAT=		60571
TOTAL US OUT/PAT EXAMS=				13373	TOTAL US SC UNITS OUT/PAT=		591479

TABLE 5

WORKLOAD OF RURAL LAB & X-RAY UNITS SYSTEM

UNIT	TOTAL X-RAY EXAMINATIONS 1989/90			TOTAL X-RAY S.C. UNITS 1989/90		
	TOTAL	IN/PAT	O/PAT	TOTAL	IN/PAT	O/PAT
ROSSELL	3082	539	2543	100127	24264	75863
BIRYLE	2085	523	1562	64914	20208	44706
ROSSBURN	1521	244	1277	33466	5414	28052
SHOAL LAKE	1378	302	1076	33471	8250	25221
DAUPHIN	15361	3432	11929	605508	143778	461730
GILBERT PLAINS	433	0	433	9625	0	9625
GRANDVIEW	1422	255	1167	34966	8329	26637
MCCREARY	1177	135	1042	28355	3694	24661
MOULIN	3264	950	2314	83890	29076	54814
STE. ROSE	4968	859	4109	130583	26830	103753
WINDYBROOKS	873	257	616	18991	5594	13397
WEEPING	5348	1172	4176	173678	41003	132675
CARADBY	1866	314	1552	41750	8410	33340
ERICKSON	1334	257	1077	31992	8242	23750
GLADSTONE	1931	434	1497	60976	14363	46613
KIDWODGA	2519	485	2034	94063	19787	74276
PORTAGE	11782	2473	9309	399944	84604	315340
MACGREGOR	421	20	393	9500	1001	8499
N.D.C.	1210	1210	0	27358	27358	0
ROYAL DAME	828	156	672	20175	5368	14807
ST. CLAUDE	573	119	454	14162	4232	9930
THEODORE	1305	155	1150	46169	6766	39403
KILLARNEY	4663	931	3732	147107	35132	111975
BALDOR	447	157	290	12329	5820	6509
BOISSEVALIN	2075	424	1651	47441	11107	36334
CARTWRIGHT	173	16	157	3805	453	3352
CRYSTAL CITY	1176	262	914	31395	7507	23888
DELORAINE	3630	604	3026	99268	20820	78448
MELITA	1952	448	1504	49159	15083	34076
MORDEN	5269	1179	4090	165992	43586	122406
ALTONA	2791	463	2328	90937	17535	73402
CANFON	5608	1501	4107	187728	54142	133586
EMERSON	471	96	375	10162	2070	8092
MANITO	1450	180	1270	31614	5793	25821
MORRIS	2605	577	2028	67617	17284	50333
SAVAN LAKE	3430	596	2834	113391	25864	87527
WINKLER	4827	1418	3409	237557	72051	165506
SELKIRK	11662	1373	10289	380406	46149	334257
BEAUSLEVILLE	4721	735	3986	156236	29773	126463
LAC DU BONNET	1563	0	1563	34735	0	34735
PINEMA	1362	243	1119	42243	8561	33682
PINE FALLS	3165	963	2202	80471	24440	56031
SELKIRK W.H.C.	819	819	0	24209	24209	0
WHITENOOTH	403	154	249	10633	4962	5671
SWAN RIVER	7200	1583	5617	274971	59901	215070
BEWITTO	177	49	128	6283	1891	4392
GENEL	5183	680	4503	159850	29350	130500
ERIKSDALE	1506	267	1239	37778	8777	29001
RIVERTON	235	0	235	4726	0	4726
STONEDALE	3104	477	2627	78525	15748	62777
TEOLON	3096	605	2491	121937	25701	96236
VIRIDEN	3661	696	2965	112681	26937	85744
MANITOBA	2311	413	1898	62553	11537	51016
REXTON	1019	186	833	26187	6267	19920
RIVERS	615	99	516	14240	2509	11731
SOURIS	3319	725	2594	102722	24172	78550
ARBORE	2399	414	1985	57931	13581	44350
ASHBURN	1244	111	1133	27795	3368	24527
CHURCHILL	1607	527	1080	53880	15421	38459
FLIN FLON	11288	1642	9646	287891	47013	240878
GILLAN	750	112	638	17953	3691	14262
GLENDORA	723	158	565	18027	5483	12544
LEAF RAPIDS	938	73	865	27384	2541	24843
LYNN LAKE	865	153	712	20504	4451	16053
ST. PIERRE	3156	813	2343	110330	34184	76146
STE. ANNE	4579	699	3880	138147	29743	108404
SNOO LAKE	622	12	610	12305	299	12006
STEINBACH	8373	1146	7227	271617	36933	234684
SUNDACCT	311	0	311	6973	0	6973
THE PAS	16029	2644	13385	495683	85787	409896
VITA	1547	280	1267	37145	8354	28791
WABANESSA	1067	144	923	24569	4158	20411

TOTAL X-RAY EXAMS- 215867
 TOTAL X-RAY IN/PAT EXAMS- 42146
 TOTAL X-RAY OUT/PAT EXAMS- 173721

TOTAL SC UNITS- 6700685
 TOTAL SC IN/PAT UNITS- 1476609
 TOTAL SC OUT/PAT UNITS 5224076

CLINICAL MICROBIOLOGY - CPL

TABLE 6.1, RESPIRATORY ISOLATES

A. RESPIRATORY	NUMBER OF ISOLATES			
	1986/87	1987/88	1988/89	1989/90
<u>C. diphtheria:</u>				
gravis toxigenic	15	18	15	16
gravis non-toxigenic	5	5	31	32
mitis toxigenic	2	2	0	1
mitis non-toxigenic	27	42	45	37
<u>B. pertussis</u>	4	1	1	42
<u>Acid Fast Bacilli</u>				
positive culture	58	52	71	72
positive smears	10	23	37	21
<u>Legionella:</u>				
L. pneumophila	3	1	2	3

TABLE 6.2, MYCOLOGY ISOLATES

B. MYCOLOGY	NUMBER OF ISOLATES			
	1986/87	1987/89	1988/89	1989/90
Presumptive Tinea				
versicolor	13	20	20	20
Candida albicans	1052	788	895	844
Dermatophytes	58	84	74	106
Blastomyces dermatidis		3	2	6

TABLE 6.3, STD ISOLATES

C. STD	NUMBER OF ISOLATES			
	1986/87	1987/88	1988/89	1989/90
N. gonorrhoea	1583	1241	1044	818
C. trachomatis	5401	5984	5738	4509
T. vaginalis	410	239	236	175

TABLE 6.4, MISCELLANEOUS ISOLATES

D. MISCELLANEOUS	NUMBER OF ISOLATES			
	1986/87	1987/88	1988/89	1989/90
C. difficile non-toxigenic	284	49	48	58
C. difficile toxigenic	324	53	99	81
Streptococcus Group A	1180	773	612	929
Streptococcus Group B	940	503	471	453
N. meningitidis	28	10	23	30
L. monocytogenes	0	0	3	2
H. ducreyi	0	1	1	--
C. difficile cytotoxin	324	277	331	269
Verotoxin			26	118

TABLE 6.5 - ENTERIC ISOLATES

E. ENTERICS	NUMBER OF ISOLATES				E. ENTERICS (cont'd)	NUMBER OF ISOLATES				E. ENTERICS (cont'd)	NUMBER OF ISOLATES			
	1986/87	1987/88	1988/89	1989/90		1986/87	1987/88	1988/89	1989/90		1986/87	1987/88	1988/89	1989/90
<i>Escherichia Coli</i> Group:					<i>Shigella:</i>					<i>Salmonellae:</i> (cont'd)				
08:K25	0	0	16	1	<i>S. boydii</i> 1 sero II	0	1	0	4	<i>S. thompson</i>	7	11	24	22
026:K60	26	23	17	14	<i>S. boydii</i> II sero 14	1	8	9	11	<i>S. baarht</i>	6	0	3	0
055:K59	30	23	3	15	<i>S. flexneri</i> 1	20	9	39	54	<i>S. litchfield</i>	2	1	1	0
066a:K61	15	3	3	3	<i>S. flexneri</i> 2	13	3	4	1	<i>S. muenchen</i>	3	9	21	15
0111:K58	13	21	14	1	<i>S. flexneri</i> 6	0	0	0	0	<i>S. newport</i>	13	6	9	16
0119:K69	1	1	6	5	<i>S. flexneri</i> X	42	15	26	16	<i>S. enteritidis</i>	16	67	30	77
0125:K70	19	11	5	15	<i>S. sonnei</i>	1	0	0	0	<i>S. baveana</i>	1	2	3	5
0126:K71	30	15	19	6	<i>S. dysenteriae</i> sero 1	4	0	0	0	<i>S. javiana</i>	14	2	4	4
0127a:K63	3	5	1	3	<i>S. dysenteriae</i> sero 2	1	0	0	0	<i>S. badar</i>	97	93	94	77
0128:K67	29	31	24	30	<i>S. dysenteriae</i> sero 3	1	1	0	0	<i>S. panama</i>	1	4	6	4
0124:K72	1	0		1						<i>S. java</i>	2	4	1	8
018A018C:K77	1	3		0	<i>Salmonellae:</i>	1	0	1	1	<i>S. tennessee</i>	1	0	0	2
0157:K7	3	23	81	114	<i>S. arizona</i>	0	4		10	<i>S. anatum</i>	3	3	5	
075:Non-motile	1	0			<i>S. group B</i>				7	<i>S. blockley</i>	7	0	3	4
<i>Campylobacter fetus</i>	160	147	137	106	undifferentiated	7	13	9	25	<i>S. alami</i>	1	2	1	
as jejuni					<i>S. agona</i>	1	1	20	14	<i>S. chio</i>	2	14	2	1
<i>Yersinia enterocolitica</i>	19	31	27	13	<i>S. brandenburg</i>	15	50	8	40	<i>S. oranienburg</i>		2	3	0
<i>Yersinia enterocolitica</i>	199	218	242	160	<i>S. heidelberg</i>	1	0	21	6	<i>S. braenderup</i>		1	1	1
<i>Yersinia enterocolitica</i>	13	6	15	11	<i>S. minnesota</i>	13	2	7	12	<i>S. waltvreden</i>		1	1	2
<i>Yersinia enterocolitica</i>					<i>S. saint paul</i>	4	0	38	91	<i>S. litchfield</i>	3	0	1	14
<i>Yersinia enterocolitica</i>					<i>S. schwarzengrund</i>	125	63	13	20	<i>S. virchow</i>	1	5	7	5
<i>Yersinia enterocolitica</i>					<i>S. typhi</i>	3	0	13	7	<i>S. stanley</i>	1	2	2	
<i>Yersinia enterocolitica</i>					<i>S. typhimurium</i>	12	13	7	1	<i>S. abankana</i>	2	2	10	
<i>Yersinia enterocolitica</i>					<i>S. senftenberg</i>	3	0	13	1	<i>S. derby</i>	38	34	7	6
<i>Yersinia enterocolitica</i>					<i>S. infantis</i>	12	13	7	20	<i>S. bovis morbillicans</i>	11	22	26	33
<i>Yersinia enterocolitica</i>					<i>S. montevideo</i>	3	0	7	7	<i>S. species</i>		3	1	0
<i>Yersinia enterocolitica</i>										<i>S. paratyphi A</i>	1	4	1	0
<i>Yersinia enterocolitica</i>										<i>S. paratyphi B</i>				

TABLE 6-6, PERCENTAGES OF ORGANISMS RESISTANT TO ANTIBIOTICS (SELECTED)

	Gentamicin	Tobramycin	Amikacin	Cefazolin/ Cephatholin	Cefoxitin	Cefotaxime	Co-trimoxazole	Nitrofurantoin	Tetracycline	Chloramphenicol	Clindamycin	Erythrocine	Vanomycin	Norfloxacin	Ceftazidime	Penicillin	Ampicillin	Ticarcillin/Pip	Cloxacillin	No. Tested
<i>Acinetobacter anitratus</i>	4	0		100	85		8	100	23								78			69
<i>Acinetobacter lwoffi</i>	2			79	88		2	62	16								23			106
<i>Aeromonas hydrophila</i>	0			43	0		6	0	0	0							94	0		143
<i>Citrobacter diversus</i>	0	0	0	0	17		0	0	0								100			18
<i>Citrobacter freundii</i>	0			86	78		40	8	31								56			68
<i>Enterobacter aerogenes</i>	0			100	100		11	33	0								100			9
<i>Enterobacter agglomerans</i>	0			90	92		4	10	0								90			31
<i>Enterobacter cloacae</i>	0	0	0	99	88		11	16	17	0				0			97	0		153
<i>Escherichia coli</i>	<1	0	0	24	<1	7	25	<1	26	31				0			43	15		2,527
<i>Klebsiella ozaenae</i>	0			0			41		0								94			17
<i>Klebsiella oxytoca</i>	0			22	0		7	3	6								98			132
<i>Klebsiella pneumoniae</i>	3		0	7	3		19	27	23								96			346
<i>Morganella morganii</i>	2			100	0		27	14	30	0							100			41
<i>Moraxella sp.</i>	4			4	0	0	33		0								26			27
<i>Plesiomonas shigelloides</i>	14			0			0										86			7
<i>Proteus mirabilis</i>	2			8	1		11	57	98								26			322
<i>Proteus vulgaris</i>	0			100	0			82	57								100			40
<i>Pseudomonas aeruginosa</i>	5	1	30				100							6	0			2		281
<i>Pseudomonas cepacia</i>	95	89	72				3							16	0			0		73
<i>Salmonella enteritidis</i>	0			0			0										0			5
<i>Salmonella hadar</i>	0			0			0										0			12
<i>Salmonella typhimurium</i>	0			0			0										0			12
<i>Serratia marcescens</i>	0	0		95	20		0	100	84								70			27
<i>Shigella flexneri</i>	0			11	0		81										78			37
<i>Shigella sonnei</i>	0			36			18										64			11
<i>Yersinia enterocolitica</i>	0			100			0										100			11
<i>Staphylococcus aureus</i>	2			2			<1				1	16				91			1	2,003
Coagulase neg. <i>Staphylococci</i>	19			17			13				10	43	0			69			20	72
<i>Staphylococcus saprophyticus</i>	0			15			12	1	67		12	54	0			92			18	91
<i>Enterococcus species</i>												82	0				3			632

ENVIRONMENTAL MICROBIOLOGY

TABLE 7-1, NUMBER OF SAMPLES TESTED

	1987 - 88	1988 - 89	1989 - 90
A. WATER - ROUTINE			
Membrane Filtration (MF)	38,326	39,189	39,912
Most Probable Number (MPN)	4,843	4,268	4,079
Standard Plate Counts (SPC)	20,948	21,664	21,774
B. FOOD			
Surveillance			
Food	417	246	194
Ice Cream	1,886	2,345	2,215
Outbreaks			
Food	<u>214</u>	<u>200</u>	<u>269</u>
Total	2,517	2,791	2,678

TABLE 7-2, ROUTINE TESTING, MEMBRANE FILTRATION

Sample Source/Type	Total Coliform		Fecal Coliform	
	Total Number of Samples	Number Positive	Total Number of Samples	Number Positive
Raw	2,827	6	43	1
Municipal	18,853	464	903	49
Well	5,937	1,116	577	46
Lake	366	31	128	3
River	685	360	831	269
Ice Machine	58	2	0	0
Swimming Pool	3,286	185	130	17
Water Mains	955	49	9	1
Miscellaneous (Pumphouse, stand- pipe, spring, cis- tern, dugouts, hydrants, reser- voir, gravel pits)	1,067	211	900	104
TOTAL	<u>34,034</u>	<u>2,424</u>	<u>3,524</u>	<u>490</u>

Positive = >2/100 mL for all drinking water

Positive = >200/100 mL for all lakes and rivers

TABLE 7-3, ROUTINE TESTING, MOST PROBABLE NUMBER

Sample Source/Type	Total Coliform		Fecal Coliform	
	Total Number of Samples	Number Positive	Total Number of Samples	Number Positive
<u>DRINKING</u>				
Tap	1,202	196	908	59
Well	189	51	118	10
Water Truck	137	16	124	3
Pumphouse	74	13	53	0
Standpipe	37	11	29	2
Bucket, Barrel	72	43	32	16
Lake	103	48	49	10
River	31	14	21	5
Miscellaneous	10	4	6	2
SUB-TOTAL	1,855	396	1,340	107
<u>RECREATIONAL</u>				
Lake	59	19	49	9
River	111	35	93	28
Miscellaneous (Dugouts, Ditch, Pond, Creek, Sewage	89	22	45	5
	1,965	708	1,965	632
TOTAL	<u>4,079</u>	<u>1,180</u>	<u>3,492</u>	<u>781</u>

Positive = >2/100 mL for all drinking water

Positive = >200/100 mL for lakes rivers and sewage

TABLE 7-4, PSEUDOMONAS AERUGINOSA DETECTION

Source/Sample	Number Positive / Number Tested		
	1987 - 1988	1988 - 1989	1989 - 1990
Swimming Pools	7/121	0/74	4/94
Whirlpools	68/419	64/389	100/699
Others	10/51	24/95	22/92
	85/591	88/558	126/885

Positive = Any number pseudomonas/per 100 mL

TABLE 7-5, FOOD TESTING RESULTS

Source/Sample	Number Positive / Number Tested		
	1987 - 1988	1988 - 1989	1989 - 1990
Surveillance			
Food	166/417	79/246 (32%)	68/194 (35%)
Ice Cream	458/1886	677/2345 (20%)	466/2215 (21%)
Outbreaks			
Food	<u>75/214</u>	<u>15/200 (8%)</u>	<u>91/269* (34%)</u>
TOTAL	699/2517	771/2791	625/2678

* - significant increase

TABLE 8-1, DIAGNOSTIC CHEMISTRY WORKLOADS - 1989 - 1990

	NO. OF PATIENTS	NO. OF CONTROLS	NO. OF STANDARDS	NO. OF REPEATS	TOTAL NO. OF TESTS	UNIT VALUE	TOTAL UNITS
CHOLESTEROL (TOTAL)	11,810	662	168	316	12,956	3	38,868
HDL-CHOLESTEROL	5,895	605	402	391	7,323	4.5	32,954
TRIGLYCERIDES	9,792	602	102	251	10,807	1	10,807
IRON AND TIBC	613	142	79	32	866	15	12,990
THYROXINE (T4)	5,764	412	744	112	7,032	7	49,224
T3 UPTAKE	1,655	324	128	78	2,185	7	15,295
TSH	3,511	333	872	167	4,833	7	33,831
VIT. B12 AND FOLATE	724	160	408	26	1,318	7	9,226
DIGOXIN	1,258	400	207	67	1,932	4	7,728
THEOPHYLLIN	459	373	192	39	1,063	3	3,189
CHOLINESTERASE	234	36	18		288	3	864
GLYCATED HEMOGLOBIN	2,006	164		4	2,174	12	26,008
MONTH TOTALS	43,721	4,213	3,320	1,483	52,777		241.064

TABLE 8-2, METABOLIC/ENDOCRINE SCREENING FINDINGS

	Identified in 1989-1990	Identified from 1965 to Mar. 31/90
PKU	1	24
Galactosemia	1	6
Galactosemia variants	-	13
Prolinemia	-	3
Histidinemia	-	20
Maple Syrup Urine Disease	-	2
Tyrosinemia	-	2
Hypothyroidism	4	41
TBG deficiency	-	2
Cystinuria	3	15
Glycinemia	-	1
Hartnup Disease	-	6
Congenital Adrenal Hyperplasia	1	1
TOTALS	9	137

TABLE 9-1. SEROLOGY/PARASITOLOGY OVERALL STATISTICS - 1989 - 1990

	NUMBER OF SPECIMENS	NUMBER OF TESTS	NUMBER OF UNITS	NUMBER OF SPECIMENS	NUMBER OF TESTS	NUMBER OF UNITS	NUMBER OF SPECIMENS	NUMBER OF TESTS	NUMBER OF UNITS
SEROLOGY	90,554	224,458	3,155,391	84,978	213,869	3,051,124	86,376	230,336	3,309,719
R&D SEROLOGY	-	7,219	149,003	-	8,466	218,710	----	11,170*	360,971
PARASITOLOGY	11,002	11,082	497,050	9,819	9,881	443,655	9,659	9,759	437,655
TOTAL	101,556	242,759	3,801,444	94,797	232,216	3,713,489	96,035	251,265	4,108,345

TABLE 9-2. TOXOPLASMA DIAGNOSTIC

<u>1986 - 1987</u>			<u>1987 - 1988</u>			<u>1988 - 1989</u>			<u>1989 - 1990</u>		
Number Tested	Number Positive	Prenatal Positive	Number Tested	Number Positive	Prenatal Positive	Number Tested	Number Positive	Prenatal Positive	Number Tested	Number Positive	Prenatal Positive
949	10	0	817	1	0	888	6	0	1288*	2	0

TABLE 9-3. BACTERIAL SEROLOGY

	Positive Level	<u>1987 - 1988</u>			<u>1988 - 1989</u>			<u>1989 - 1990</u>		
		Number Tested	Number Positive	Positive Percent	Number Tested	Number Positive	Positive Percent	Number Tested	Number Positive	Positive Percent
Widal	1:50	42	4	9.5	34	3	8.8	77	4	5.2
Brucella abortus	≥1:160	186	13	7.0	271	6	2.2	242	2	0.8
Pasteurella tularensis	≥1:180	21	4	19.0	32	2	6.3	59	3	5.1

TABLE 9-4, HEPATITIS SEROLOGY

	1987-1988			1988-1989			1989-1990		
	Number Tested	Number Positive	Percent Positive	Number Tested	Number Positive	Percent Positive	Number Tested	Number Positive	Percent Positive
HBeAg*	8,949	535	6.0	8,119	523	6.4	8,230	504	6.1
Anti HBs	1,386	717	51.7	1,615	861	53.3	1,836	886	48.3
Anti HBc	311	68	21.8	961	140	14.6	1,116	185	16.6
HBeAg	282	107	38.0	375	169	45.0	429	221	51.5
Anti HBe	282	136	48.2	376	156	41.5	429	150	34.9
HAV IgG/IgM	37	21	56.8	74	44	59.5	113	64	56.6
HAV IgM	2,641	122	4.6	2,502	48	1.9	2,377	62	2.6
Anti HBcIgM	134	13	10.3	104	11	10.6	96	6	6.2
Anti Delta	16	-	-	23	1	4.3	8	0	0
Anti HCV	-	-	-	N/A	N/A	N/A	606	66	10.9

*HBeAg diagnostic tests, i.e. excluding screening of prenatal sera

TABLE 9-5, RESPIRATORY SEROLOGY

A. Tests Done on Single Bloods		1986-1987		1987-1988		1988-1989		1989-1990	
		Number Tested	Number Positive	Number Tested	Number Positive	Number Tested	Number Positive	Number Tested	Number Positive
ASOT		2,063	435	1,618	309	1,529	229	1,432	241
ADB		156	19	179	24	234	27	235	26

B. Tests Done on Paired Bloods

	1987-1988					1988-1989					1989-1990				
	Number Tested	Seroconversion	Significant Change in Ab	High Static	Presence IgM	Number Tested	Seroconversion	Significant Change in Ab	High Static	Presence IgM	Number Tested	Seroconversion	Significant Change in Ab	High Static	Presence IgM
Mycoplasma pneumoniae	2,199	4	4	21	72	2,653	3	1	10	8	3,737	7	-	46	34
Legionella spp.	1,241	3	-	2	10	1,041	1	1	1	3	1,128	2	1	-	3
Chlamydia spp.	265	-	-	-	3	393	3	2	3	8	419	4	-	6	12
Q Fever	109	-	-	-	-	99	-	-	2*	-	112	-	-	-	-
Adenovirus	1,217	3	-	12	N/A	1,189	5	-	6	-	1,481	13	1	17	N/A
RSV	1,103	2	-	4	-	993	13	-	1	-	1,399	22	-	9	N/A
Parainfluenza 1	968	-	1	-	-	690	-	-	-	-	1,391	4	1	4	N/A
Parainfluenza 2	969	-	-	-	-	690	-	-	-	-	1,383	4	-	2	N/A
Parainfluenza 3	969	-	-	-	-	693	3	-	6	-	1,386	9	1	46	N/A
Influenza A	1,228	14	-	12	-	1,306	56	-	7	-	1,601	95**	1	58	N/A
Influenza B	1,061	34	-	1	-	1,076	20	-	7	-	1,472	1	1	5	N/A

*Low static titre to Phase II

**Influenza outbreak in winter 1989/90

TABLE 9-6. SYPHILIS SEROLOGY

	1987-1987		1987-1988		1988-1989		1989-1990	
	Number of Specimens	Number Reactive	Number of Specimens	Number Reactive	Number of Specimens	Number Reactive	Number of Specimens	Number Reactive
Blood	55,267	740	50,285	505	48,383	379	44,937	341
CSF	440	3	313	-	163	2	157	1
IFA	42	3	42	-	25	-	26	-

	1984-1985	1985-1986	1986-1987	1987-1988	1988-1989	1989-1990
No. Persons Reactive with Previous History	814	748	645	434	335	277
New Cases	86	69	43	7	5	5
New Cases in Registry	61	75	58	64	39	59

TABLE 9-7. HERPES SEROLOGY

	1987-1988				1988-1989				1989-90			
	Number Tested	Sero-conversions	Signi- ficant Change in Ab	Number IgM Positive	Number Tested	Sero-conversions	Signi- ficant Change in Ab	Number IgM Positive	Number Tested	Sero-conversions	Signi- ficant Change in Ab	Number IgM Positive
Herpes simplex	1,930	2	-	115	2,347	-	2	122	2,185	-	-	160
Herpes zoster	764	-	-	49	1,247	2	-	38	899	2	-	57
Cytomegalovirus	2,149	-	1	94	2,538	-	1	87	2,430	1	-	115
Epstein-Barr IgM	2,962	NA	NA	148	3,444	NA	NA	173	3,639	-	-	152

TABLE 9-8. MISCELLANEOUS VIRUS SEROLOGY

	1987-1988				1988-1989				1989-1990			
	Number Tested	Sero-conversions	Signi- ficant Change in Ab	Number IgM Positive	Number Tested	Sero-conversions	Signi- ficant Change in Ab	Number IgM Positive	Number Tested	Sero-conversions	Signi- ficant Change in Ab	Number IgM Positive
Measles	997	-	-	24	1,282	-	-	20	1,063	-	-	12
Mumps	565	-	-	17	750	-	1	15	594	-	-	29

	1987-1988			1988-1989			1989-1990		
	Number Tested	Sero-conversions	High Static Titre	Number Tested	Sero-conversions	High Static Titre	Number Tested	Sero-conversions	High Static Titre
RMSF	13	-	-	67	1	-	4	-	-
Rotavirus	176	1	-	351	3	-	137	-	1
Cox. B (1-5)	-	-	-	NA	NA	NA	584	8	4
WEE	-	-	-	55	-	-	51	-	-

TABLE 9-9, IMMUNE STATUS SEROLOGY

	1987-1988		1988-1989		1989-1990	
	Number Tested	Percent Susceptible %	Number Tested	Percent Susceptible %	Number Tested	Percent Susceptible %
Measles	107	13.1	51	13.7	92	26.1
Mumps	71	16.9	42	19.0	45	22.2
Diphtheria	171	13.5	176	29.5	102	30.4
Tetanus	172	10.5	174	9.2	108	10.2
Pertussis	84	6.0	73	15.1	447*	8.5
Varicella/Zoster	2,096	4.8	1,175	5.7	2,104	5.3

*Outbreak of Pertussis, this figure includes diagnostic specimen

TABLE 9-10, RUBELLA SEROLOGY

A. Total Number of Rubella Tests			
	1987-1988	1988-1989	1989-1990
PHA Screening	28,728	26,134	26,406
IgM	691	679	753

B. Details of Prenatal Surveillance									
Test	1987-1988			1988-1989			1989-1990		
	Number Tested	Susceptible	Percent	Number Tested	Susceptible	Percent	Number Tested	Susceptible	Percent
PHA	15,231	401	2.6	15,169	352	2.3	15,231	418	2.7

C. Details of Rubella Diagnostic Testing									
Test	1987-1988			1988-1989			1989-1990		
	Number Tested	Number with IgM Present	Percent	Number Tested	Number with IgM Present	Percent	Number Tested	Number with IgM Present	Percent
IgM	691	9	1.3	679	14	2.1	753	21	2.8

D. Details of Prenatal Surveillance - Hepatitis								
Test	1988-1989				1989-1990			
	Number Tested	Number Positive	New Positive	%	Number Tested	Number Positive	New Positive	%
HBsAg	15,231	54	22	.15	15,369	69	41	.27

TABLE 9-11, IMMUNOLOGY-SEROLOGY

	Normal Values	1987-1988		1988-1989			1989-1990	
		Number Tested	Number with Significant Results	Number Tested	Number with Significant Results		Number Tested	Number with Significant Results
CRP	<5mg/L	103	34	124	36		247	36
Rheumatoid factor**	<1:24	2,105	124	1,594	141		2,200	117
Antinuclear factor**	<1:160	1,156	63	1,040	40		1,369	75
Antimitochondrial	<1:40	54	4	30	6		118	6
Anti Smooth Muscle	<1:40	35	4	15	2		42	2
Anti-DNA	<1:20	146	5	126	6		227	8
Anti-Parietal	<1:20	3	1	3	3		8	3
Thyroglobulin antibody**	<1:160	369	37	73	6		142	4
Microsomal antibody**	<1:160	369	67	73	20		142	9
IgG	564-1765 mg/dl	N/A	N/A	41	3(H)* 3(L)*		157	8(L)* 2(H)*
IgM	45-250 mg/dl	N/A	N/A	36	- 2(L)*		153	6(L)* 3(H)*
IgA	85-385 mg/dl	N/A	N/A	33	4(H)* 2(L)*		154	14(L)*
C ₃	70-180 mg/dl	N/A	N/A	77	3(H)* 2(L)*		199	6(L)* 6(H)*
C ₄	163-44.7 mg/dl	N/A	N/A	78	2(H)* 10(L)*		199	15(L)* 3(H)*

**Both tests marked with ** must be elevated to be considered an autoimmune thyroid disease.

*H - Higher than normal values

*L - Lower than normal values

Increased tested for immunoglobulins is mainly for the Lab & X-ray Units

**Rheumatoid factor/ANA testing - increased due to cross efficiency panel for Lyme Serodiagnosis

TABLE 9-12, Diagnostic HIV - December 1985 - March 31, 1990

	<u>Symptomatic</u>		<u>Asymptomatic</u>		<u>Total</u>	
	Positive (%)	Negative	Positive (%)	Negative	Positive (%)	Negative
Males	128 (10.8%)	1,048	129 (2.5%)	5,072	257 (4%)	6,120
Females	5 (1%)	481	10 (0.25%)	3,850	15 (0.34%)	4,331
Total	133 (8%)	1,529	139 (1.5%)	8,922	272* (2.5)	10,451

* 94.4% of seropositive persons are male

TABLE 9-13, Diagnostic HIV - December 1985 - March 31, 1990

Category	Number Positives*/Number Tested (% Positive)				Comments
Homosexuals	160	/	1,791	(8.9%)	2/160 from endemic area
Bisexuals	38	/	469	(8.1%)	3/38 from endemic area
Haemophiliacs	18	/	97	(18.5%)	
Intra Venous Drug User (IVDU)	6	/	828	(0.7%)	2/6 had "risky" sexual contacts
Global only, ie from endemic area	9	/	185	(4.8%)	
Homosexuals and IVDU	10	/	61	(16.3%)	1/10 also from endemic area
Bisexuals and IVDU	4	/	38	(10.2%)	1/4 also from endemic area
Blood transfusion	3	/	782	(0.3%)	
Heterosexual exposure	15	/	2,607	(0.5%)	
Accidental parenteral exposure	0	/	1,014		
Other risks	7	/	4,427	(0.15%)	
Offspring	2	/	42	(4.7%)	Same baby - parents from endemic ar
	272	/	10,723**	(2.5%)	

* 11/272 had identical codes and risk factors; same person?

** HIV antibody negative persons may have had multiple risk factors each entered in the corresponding line, for a total of 12,341 entries.

*** 10,723 persons were entered in the computer database, of these, 10,451 were negative.

TABLE 9-14, Diagnostic HIV April 1, 1989 - March 31, 1990

Category	Number Positive/Number Tested			% Positive
Homosexuals/Bisexuals	52	/	529	(9.8%)
Intra Venous Drug Users (IVDU)	2	/	225	(0.8%)
Homosexuals/Bisexuals/IVDU	2	/	23	(8.6%)
Haemophiliacs	6	/	40	(15%)
Global Endemic Areas	2	/	64	(3.1%)
"Others"	10	/	2289	(0.4%)
Totals	74	/	3170	(2.3%)

TABLE 9-15, Diagnostic HIV - December 1985 - March 31, 1990

	Number positive / Number tested (% Positive)			
Winnipeg	240	/	8,865	(2.7%)
Thompson	1	/	126	(0.8%)
Norman	2	/	76	(2.6%)
Parkland	1	/	145	(0.7%)
Interlake	4	/	295	(1.3%)
Westman	10	/	483	(2%)
Central	4	/	322	(1.2%)
Eastman	0	/	162	----
Out-of-province	10	/	163	(6.1%)
Other	0	/	86	----
	272	/	10,723	(2.5%)

TABLE 9-16, Diagnostic HIV - December 1985 - March 31, 1990

Age Group	Number Positive/Number Tested (% Positive)			
0 - 11 months	1	/	361	(0.2%)
1 - 9 years	3	/	151	(1.9%)
10 - 19 years	12	/	628	(1.9%)
20 - 29 years	115	/	4,301*	(2.6%)
30 - 39 years	100	/	3,234*	(3%)
40 - 49 years	25	/	1,205	(2%)
50 - 59 years	11	/	449	(2.4%)
60 - 69 years	3	/	233	(1.2%)
70 - 79 years	1	/	109	(0.9%)
80 or over	1	/	52	(1.9%)
TOTAL	272	/	10,723	(2.5%)

* Most of the seropositives are in age group 20 - 40.

TABLE 9-17, PARASITOLOGY YEAR END REPORT

	1988/1989	1989/1990
Positive Patients*/Patients Examined	681/6071	680/6233
A. <u>Intestinal Protozoa</u>		
Entamoeba histolytica	36	46
Dientamoeba fragilis	49	47
Giardia lamblia	185	210
Cryptosporidium sp.	20	54
Blastocystic hominis	210	249
B. <u>Blood Protozoa</u>		
Plasmodium vivax	4	5
Plasmodium falciparum	1	2
C. <u>Cestodes</u>		
Diphyllobothrium sp.	9	5
Taenia sp.	5	1
Hymenolepis nana	7	8
D. <u>Trematodes</u>		
Clonorchis sinensis	21	9
E. <u>Nematodes</u>		
Ascaris lumbricoides	29	24
Enterobius vermicularis	19	38
Hookworm sp.	27	30
Strongyloides stercoralis	10	12
Trichuris trichuria	39	29
F. <u>Serology</u>		
Antibodies to Amoeba	3	1
Antibodies to Hydatid	1	4
G. <u>Arthropods</u>		
Phthirus pubis	2	7
Pediculus humanis	1	2
MITES	1	1
CIMEX SP.	1	2
NITS	2	2
TICKS	2	6

* Does not include patients with nonpathogenic organisms

Table 10-1, Virus Isolations Compared

VIRUS ISOLATIONS	1967-1968	1968-1969	1969-1990
	NO. OF DETECTIONS	NO. OF DETECTIONS	NO. OF DETECTIONS
<u>ADENOVIRUS</u>			
Untyped Adenovirus	8	55	237
Adenovirus 1	29	25	16
Adenovirus 2	24	47	23
Adenovirus 3	11	19	64
Adenovirus 4		0	
Adenovirus 5	8	5	16
Adenovirus 6	2	10	5
Adenovirus 7	3	5	1
Adenovirus 8			1
Adenovirus 11		1	
Adenovirus 12			1
Adenovirus 19			1
Adenovirus 31		2	
Adenovirus 40			2
Adenovirus 41			14
Adenovirus 41A		13	
<u>COXSACKIE</u>			
Coxsackie A9		5	2
Coxsackie B3		4	
Coxsackie B4		10	1
Coxsackie B5		6	4
Coxsackie B			1
<u>HERPES</u>			
Varicella zoster	17	20	40
Cytomegalovirus	123	86	127
Herpes simplex	1,571	1,503	1,415
Herpes simplex 01	1	93	10
Herpes simplex 02	2	6	10
Herpes virus (by E.M.)	18	11	
Herpes virus			28
<u>ECHOVIRUS</u>			
Echovirus			1
Echovirus 1			
Echovirus 5		1	
Echovirus 6			5
Echovirus 7	9		
Echovirus 9	10	6	2
Echovirus 11	3	3	2
Echovirus 14	6		
Echovirus 17	4		
Echovirus 18		3	
Echovirus 21	4		
Echovirus 22	6	5	3
<u>CORONAVIRUS</u>			
	9	2	3

cont'd

Table 10-1, cont'd

VIRUS ISOLATIONS (Cont'd)	1987-1988 NO. OF DETECTIONS	1988-1989 NO. OF DETECTIONS	1989-1990 NO. OF DETECTIONS
<u>INFLUENZA</u>			
Influenza A	4	62	118
Influenza B	12	5	2
<u>PARAINFLUENZA</u>			
Parainfluenza 01		1	1
Parainfluenza 02	1	1	3
Parainfluenza 03	13	18	21
<u>POLIOVIRUS</u>			
Poliovirus 01	4	1	3
Poliovirus 02	3	4	4
Poliovirus 03	3	1	4
<u>ENTEROVIRUS</u> (Not typed)	148	212	35
Enterovirus 6			1
<u>CALICIVIRUS</u>			1
<u>MOLLUSCUM CONTAGIOSUM</u>		5	5
<u>ROTAVIRUS</u>	214	230	167
<u>RESPIRATORY SYNCYTIAL VIRUS</u>	75	166	434
<u>REOVIRUS</u>			
Reovirus			3
Reovirus 01		1	
Reovirus 02	4	0	1
Reovirus 03		3	
<u>PAPILLOMAVIRUS</u>			
Papillomavirus 06		488	377
Papillomavirus 11		497	383
Papillomavirus 16		398	372
Papillomavirus 18		397	369
<u>RHINOVIRUS</u>		5	9
<u>SMALL ROUND ENTERIC VIRUS</u>			67
<u>SMALL ROUND VIRUS</u>			2
<u>UNIDENTIFIED VIRUS</u>		22	9
<u>HIV</u>			93